12

AN ENQUIRY INTO THE NATURE and PRINCIPLES OF THE *SPAW WATERS.*

WITH A
MECHANICAL EXPLANATION of their
VIRTUES and USES in many DISEASES.

To which is ſubjoined,

A CURSORY ENQUIRY into the NATURE and PROPERTIES of the HOT FOUNTAINS at *Aix la Chapelle.*

By CHARLES PERRY, M. D.

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TO THE

Moſt LEARNED and RENOWNED

Dr. *BOERHAAVE*,

PROFESSOR at *Leyden*, &c. &c. &c.

Much Honoured SIR,

THE following Treatiſe has a more than common Call to throw itſelf at your Feet; as it has already been partly peruſed by you in Manuſcript, and, ſo far, honoured with your Approbation: But beſides that, the Nature of the Subject, and the particular Manner I have treated it in, give it a very natural and juſt Appeal to you.

Mineral Waters in general, and thoſe of *Spaw* in particular, (though ſtrictly ſpeaking complex Bodies) conſtitute an illuſtrious Branch of the *Medicina ſimplex*. This beautiful and excellent Part of Medicine, (*viz.* the *Medicina ſimplex & genuina*,) is what you have always been a firm Votary to: And your Endeavours to promote, cultivate, and reſtore it to its ancient Purity, (after it has for ſo many Ages been oppreſſed and darkned by a Succeſſion of enthuſiaſtical Syſtem Writers and Methodiſts,) have been more happy and ſucceſsful, perhaps, than thoſe of any other Perſon whatever.

The *Utile Dulci* of *Horace*, is in nothing more fully exemplified than in the *Spaw* Waters; for every one's Experience teſtifies that they are not leſs grateful to the Palate, than they are beneficial to the Conſtitution. A very ſingular Happineſs to Mankind This! That a Medicine indued with ſo many and ſo great Virtues, ſhould (contrary to almoſt every Thing elſe in the Medicinal Sphere) be even coveted, on account of its Delightfulneſs to the Palate and Stomach, as well as other inſtantaneous happy Effects it produces in the human Fabrick.

It was the high Opinion I had of theſe Waters, founded partly on Experience, and partly on Tradition, that firſt inſpired me to this Undertaking; and I embraced it with the greater Zeal and Ardor, as I flattered myſelf, that by viſiting them at their Source, and analyzing them by all the Ways that Reaſon and Information could ſuggeſt to me, I ſhould be able to reſcue them from the Confuſion and Obſcurity in which they have been immerged by the chymical metaphyſical Definitions of their own Country Men: And, indeed, it were a great Pity, but ſo excellent and uſefull a Part of Medicine, as mineral Waters in general, and thoſe of *Spaw* in particular are, ſhould be ſet in the juſteſt and cleareſt Light they are capable of. Such is the real End and Deſign of this Treatiſe; in which I have endeavoured to ſtrip them of their Masks and Diſguiſes, whether Chymical or Empirical; to reduce their Forces and Operations to a ſort of *Calculus*, and to explain their Effects *à Priore*; that is, from their inherent mineral, and other Impregnations: And this Method of determining on the Effects of Medicines, *à Priore*, is certainly in great Meaſure practicable, notwithſtanding the great Difficulties ſome Perſons make about it.

Treating the Subject in the Manner I have done, neceſſarily led me into ſuch Reflections and Definitions as retain to the Chymic Sphere; and eſpecially whilſt I was employed about the firſt Part, or Baſis of the Work: *viz.* The Analyzation of complex Bodies, and the Separation, Inveſtigation, and Definition of their Minerals, or other Principles: But after that, in accounting for the Virtues, Properties, Operations, and Effects of them, I have ſtrictly confined myſelf to the moſt abſtracted mechanical Reaſoning.

I ſhall not in this Addreſs (conformable to the Example of Dedicators in general) attempt to bribe your Favour, *&c.* by reciting a long Catalogue of your great Merit and Abilities.

No! There is no Occaſion; neither, indeed, is there Room for it. You need no Aſſertors; your great Merit and Abilities, and your conſummate Skill in every Branch of the Medicinal Science, are avowed and acknowledged throughout the whole World, at leaſt, all its diſciplined Kingdoms and Eſtates. However, though I had no ſuch mean temporary Views and Motives, in ſeeking for your Adoption to this ſmall Performance; yet I confeſs am not a little pleaſed, that I have the Liberty to prefix your Name to it: For that alone (the Merit of the Work apart) will guard it againſt the Poiſon of Detraction, Calumny, and Slander: And moreover, as it will greatly contribute to draw the Eyes of the World upon it; ſo will it increaſe the Number as well as the Attention of its

Readers, and by that Means render the Benefits it's deſigned to recommend more diffuſive.

It may, perhaps, ſeem ſtrange to the World, that I don't publiſh this Piece in *Latin*, or ſome other Language, with which it may be judged you are better acquainted: But all Surprize upon that Account will vaniſh, when People come to be informed, that you are a very good Judge of the *Engliſh* Tongue; a Thing well known to an infinite Number of Perſons, who yearly go to *Leyden* for your Advice, upon the various Diſeaſes for which they could find no Cure at Home. But moreover, this Treatiſe is particularly written for the Benefit and Inſtruction of the People of *Britain* and its Dependencies; therefore publiſhing it in a Tongue not familiar to that Community,

munity, would have been going from the main End and Deſign of it.

That you may long live in uninterrupted Health, for the Honour and Advancement of the Science of Phyſick in particular, and the Good of Mankind in general, is the ſincere Wiſh of,

SIR,

Your Moſt Obedient, and

Moſt Devoted Servant,

CHARLES PERRY.

THE PREFACE.

AS the following Treatiſe *took its Riſe from one Accident, ſo its Publication has been poſtponed by another: Otherwiſe, it had appeared ſeven Years ago; that is, ſoon after my Return from* Spaw.

The great Opinion I always had of the Spaw *Waters, ever ſince I have been converſant with them, and capable to judge of them, determined me in the Purpoſe of viſiting them at their Source, and inſpired me with the Deſign of publiſhing my Sentiments upon them one Time or other: But, I confeſs, I had no Thoughts of writing upon them during my Stay there, 'till the very Day I ſet about it. I muſt acknowledge (however,) that I made a Journey to* Spaw, *chiefly with Deſign to examine into the ſeveral mineral Springs there; and*

and thence to furniſh myſelf with Materials for writing upon them, when I ſhould be more reſolved upon the Undertaking, and have more Leiſure to execute it.

For, the firſt Part of the Time I ſpent there, I applyed myſelf very aſſiduouſly to the Examination of the ſeveral Waters: At the ſame Time, I inſinuated a Deſign of writing a Treatiſe *upon them, (meaning one Time or other) on Purpoſe to give Birth to ſome Practice; that ſo I might have an Opportunity of experiencing the Virtues of the Waters at their Sources, as well as examining into their Principles.*

Several Gentlemen of my Acquaintance, miſtook my Meaning, as to the Time of writing upon them, judging I propoſed to do it there, whilſt upon the Spot; and they reported my Deſigns under this miſtaken Senſe. Hence, by the Time I had compleated my Examinations and Experiments upon the Waters, I gathered from ſome Hints, that my Inſinuations of a Deſign to write a Treatiſe *upon them, were miſapprehended as to the Time of doing it; and that it was expected I would do it then. Hearing this, I reſolved to fulfill* *my Words, even in this miſtaken Conſtruction, rather than ſubject them to Cenſure, and diſappoint my Friends.*

The whole Piece (I will venture to ſay) is wrought up mechanically. There is not a Sinew, nor ſo much as a Thread, in the whole Frame, of any other Nature or Temper, except only the Baſis or main Springs: And theſe are certain, real, and evident Principles inherent in the Waters; from the Conſideration of which, in their various reſpective Natures, Mixtures, and Proportions, I have rationally deduced all their Virtues, and have directed them to their reſpective Diſeaſes and Uſes.

This Subject (I confeſs) has for a long While been my particular Favourite: And, as I have advanced ſome Thoughts and Reflections upon it, which are altogether new, and which Writers who have gone before me ſeem not ſo much as to have thought of; ſo I hope they will be no leſs ſingular for their Uſe and Benefit. As I have always been a great Admirer of theſe Waters, and a great Votary to them; ſo I have been of Opinion, could we once adjuſt and aſcertain their Virtues and Uſes upon the

the Principles of true mechanical Reaſoning, we might by that Means render to the World, a more agreeable and ſafe, as well as a more effectual Remedy for an Infinity of Diſeaſes, than either the Galenical or Chymical Syſtems are capable of affording us.

If what I have advanced in the following ſhort Treatiſe, *has the good Fortune to place theſe Waters in a ſtronger and more diſtinguiſhable Point of Light, than they at preſent enjoy; to raiſe the Opinion of the World in their Favour, and to encourage, as well as inſtruct Mankind, when and how to uſe them; I ſhall think the ſmall Pains I have taken amply recompenced, as I may then aſſure myſelf I have advanced ſomething which will promote the publick Good.*

I have touched but very briefly on the Aix *Waters, by Reaſon my Enquirys were confined to ſome of their abſtracted Principles; having no Opportunity of examining into thoſe Waters at their Source, except only by the Sight and Taſte.*

The following Piece is but ſmall in the whole; but then it contains ſcarce any Thing more than what is really eſſential to the

the Subject: And I only wiſh the Publick may accept it with as much Sincerity and Candour as I offer it. It is meerly deſigned to place not only the Waters, but their Virtues and Uſes likewiſe, in ſuch a Point of Light as may render them viſible to every Body; and to inſtruct the Publick when and where to apply to them: that is, upon what Diſorders, and what particular Water to make Choice of under the different Kinds of Diſeaſes. I have proved their Principles by Analyzation, and their Virtues from their reſpective Principles; conſidered firſt ſimply and ſeparately, and afterwards in a compounded State; from the Relations they have with, and the Proportions they bear to one another. My Deſign is to ſerve the Publick; by recommending to thoſe who are, or may be diſeaſed, the Uſe of ſuch Remedies as, when rightly applied, will be innocent, agreeable, and effectual; inſtead of thoſe that are too often not only nauſeous and ineffectual, but deſtructive too.

I wiſh every Thing I have ſaid in the following Treatiſe, *in Behalf of the* Spaw *Waters, may be juſtified by Proof and Experience:*

perience: To which End it is neceſſary to admoniſh the Publick in a Point or two. And, Firſt, *That in all Caſes of Importance, Perſons rather go to* Spaw, *than content themſelves with taking its Waters tranſported to* England, *or elſewhere. For, whereas in and about* Spaw, *there are ſeveral mineral Springs (as I ſhall ſhew hereafter) which have their diſtinct Virtues and Uſes; of all theſe, the Water of only One will ſtand the tranſporting: And even that, which is called the* Pouhon, *muſt undoubtedly loſe both in its Force and Vigour, by Time and Tranſportation.* Secondly, *There are great Quantities of ſpurious Waters carried to* England *and other Places, under the Colour and Name of* Spaw*: As for Example; the Water of* Cheveron, (*commonly called* Bru *Water*) *which is much inferior to the true tranſportable* Spaw *Water: And beſides, the ſaid* Bru *Water having been faithfully and accurately examined by the Faculty of Phyſick at* Liege, *appeared to be impregnated with a noxious Mineral, on Account of which it ought rather to be condemned than recommended for any medicinal Uſe.*

But here methinks! at a Time when I am about to enumerate the many excellent and uſeful mineral Springs, which Providence had endowed a foreign Dominion with; I ſhould be wanting in Gratitude to that Providence, did I not acknowledge the like Benefits which our own native Iſle, Great-Britain (*juſtly deemed the Rival of the Univerſe, on many Accounts*) *is bleſſed with.*

Our mineral Waters, I allow indeed, are, in Nature and Excellency, inferior to thoſe of Spaw *and* Aix: *But theſe excepted, and thoſe of* Piermont, *are ſeconded to none yet diſcovered for medicinal Qualities. We have a great Number of Springs, conſpicuous for their Virtues of this Kind; but the moſt remarkable and renowned, are thoſe of* Bath, Briſtol, Scarborough, *and* Tunbridge. *There is likewiſe (beſides ſeveral other mineral Springs of leſs Note in the ſame Kingdom) one very famous Well at* Waxford, *in* Ireland, *called* St. Peter's Well. *This has been reported to me, to afford a Water highly impregnated with Minerals of excellent Virtues and Qualities. Thus much is certain, that it brings a great*

Concourſe of People there every Seaſon, and very great Cures are aſcribed to it.

Each of theſe Waters has been thought worthy to employ the Pens, as well as the Practice of ſome one, or more eminent Phyſicians. I have read Pieces on the Bath, *the* Briſtol, *and the* Scarborough *Waters: And tho' I acknowledge theſe Pieces are not ill wrote, yet I cannot omit to offer as my Opinion, that they may be treated in a different Light, to much greater Advantage: That is, in ſuch a Manner as will more effectually obviate, aſcertain, and illuſtrate their reſpective Virtues and Uſes: In Conſequence of which, the ſeveral Waters will obtain their due Weight in the publick Eſtimation, and People will be naturally led to have more frequent Recourſe to them.*

The Method I would recommend, and which I would take myſelf in examining the ſaid Waters (could I ſpare the Time, &c. *neceſſary to go through ſuch an Affair,) ſhould be,* Firſt, *To make exact and complete Analyſis of each Water;* Secondly, *When I had duely diſcovered what Minerals, or other Principles they were impregnated with; I would*

would mechanically explain the Virtues and Properties of their reſpective Principles; conſidering them firſt in their ſimple and genuine, and afterwards in their compounded State: And laſtly, determine and direct each particular Water to its proper Diſeaſes and Uſes.

This is the Method I have ſtrictly obſerved in the following Treatiſe on the Waters of Spaw *and* Aix. *I take this to be a plain and fair Way of dealing; and 'tis what, perhaps, may be more perſuaſive with Mankind, as well as more Inſtructive to it, than the Methods generally uſed by Phyſical Authors, of enforcing the Virtues and Uſes of this or that Water, or other Medicament, by reporting a long Catalogue of its Cures; which, notwithſtanding the Veracity and Merit of the Author, the World will perhaps give but little Credit to.*

The ingenious Doctor Cocquillet, *ſenior, of* Spaw, *(who, beſides ſome actual Helps, gave me many Directions and Inſtructions in analyzing the Waters of* Spaw,*) is intirely of my Opinion in this Particular. He aſſured me that he declined writing a Hiſtory* *of the Cures effected by the* Spaw *Waters, (though much importuned to it as well by Phyſicians as others) becauſe he imagined a great many real Truths would appear to the World mere Romance. And yet, I believe, there is no Man better qualified to give a practical Treatiſe on them, and Hiſtory of their Cures than him; He having been intimately converſant with them, and conſtantly in the Experience of them, for above thirty five Years paſt, computing to the Time I was there.*

AN
ENQUIRY
INTO THE
Nature and Properties
OF THE
SPAW WATERS, &c.

SECT. I.

Contains a brief Deſcription of the Town of Spaw, *and its adjacent Country; an Account of the principal Mineral Springs in and about it; and an Enquiry into the great Volatility of their Waters.*

THE whole Country, for a conſiderable Extent, about the Town of *Spaw*, is very mountainous and rocky. The Town it ſelf is ſituate in a Bot-

tom,

tom, at the Foot of a Mountain, whoſe Declivity is very ſteep, and deſcribes a Semicircle about it; extending from the West-North-Weſt to the Southward of the Eaſt: Whence it is no Wonder the Place is healthy; being ſo entirely covered from the Winds of the North-Weſt and North-Eaſt: Quarters, which conſtant Experience teaches us, are extreamly hurtful and pernicious to our Conſtitutions. The Mountain, which thus half encompaſſes the Town, is exceeding rocky; and, upon a clear and ſerene Day, affords an agreeable, though romantick Proſpect. The Town is ſmall, but pleaſant and commodious enough. The Spot, on which it ſtands, is unequal, and ſomewhat rocky. It has a Fountain of ſoft Water in the Midſt of it; which is not brought thither by Art, but riſes out of the Earth naturally: It is excellent in its Kind; is perpetually running; and ſupplies all the Inhabitants of the Town.

I decline giving a more particular Deſcription of the Town, or any Detail of its Cuſtoms and Regulations, (which may be found to Exactneſs in abundance of Writers,) thoſe being foreign to my Deſign; but ſhall haſten to my Purpoſe.

There are in and about the Town of *Spaw* ſeveral Springs of Mineral Waters; of which only five are remarkable. Theſe are the *Pouhon*, *Geronſter*, *Sauveniere*, *Tonnelet*, and the *Wartroz*; of which, only the three firſt are now in Reputation and Uſe: To them, therefore, I ſhall chiefly confine my Reflections. And,

Firſt: The Fountain called the *Pouhon*, (from whence all the Water, which is tranſported to *Britain*, and other foreign Parts, is or ought to be taken) is in the Midſt of the Town, about thirty Paces below the abovementioned Fountain of ſoft Water. It derives itſelf from that Part of the Mountain which lies to the Northward of it; and ſprings up out of the Earth into a Baſon made on Purpoſe to receive and contain it; which is ſo plentifully ſupplied, that it ſeems almoſt inexhauſtible.

The *Geronſter* is ſituate on a Hill, about two *Engliſh* Miles from *Spaw*, to the Southweſtward of the Town; and ſprings up into the Hollow of a Rock, ſhaped like the Baſon of the *Pouhon*. This Water (which is much to be lamented) will not ſtand tranſporting to foreign Parts; for upon ſeveral Trials it has always turned feculent and putrified;

whence it becomes nauſeous to the Sight, as well as to the Taſte; and all its Virtues are very much enervated, if not entirely loſt.

The *Sauveniere* lies on the Side of an Eminence, about half a League from the Town, to the South-Eaſt of it; and ſprings up out of the Cleft of a Rock, which naturally forms a convenient Baſon to receive and contain it. But this Baſon, as well as the Spring that riſes into it, are much leſs than either of the former, inſomuch, that ſometimes it has been inſufficient to ſupply the Concourſe of People, who come to drink of it: In which Caſe every one is limited to a certain Quantity. This Water (like that of the *Geronſter*) is unfit for Tranſportation; but from a very different Cauſe: For the Strength and Volatility of its mineral Impregnations are ſo great, that they would certainly burſt the Bottles; except they were left uncorked for a conſiderable Time, that the more active, elaſtic, and volatil Particles might fly off; by which Means it would looſe much of its Virtue, as well of its Force and Vigour.

Within about ſix Paces from the *Sauveniere* is another ſmall Source, called *Groesbeeck*; which derives its Title from a Baron of that

Name; who meeting with an extraordinary Cure by that Water, after all the other Springs had failed him, cauſed a Stone handſomely carved to be placed over it, (ſupported by two others, one on each Side,) which are a very pretty Ornament to it. The carved Stone that is placed at Top, bears the following Inſcription, as a Teſtimony of the Water's Excellency. *Paulus Johannes Baro a Groesbeeck. Archi. Cond. Sereniſſimæ ſuæ Celſiſſimæ Cancellarius, Vitiantem a vera ſeperabat.* This Water, though almoſt out of Uſe now, is exceeding volatil, and has a delightful Flavour.

The *Tonnelet* and the *Wartroz* are likewiſe very ſtrongly impregnated with Minerals; though perhaps they may be different in Kind, Mixtures, and Proportions, to the reſt. But, as theſe latter are now almoſt out of Date, and quite out of Uſe, I ſhall be very brief in my Reflections upon them.

The three Springs firſt deſcribed, as they are impregnated with the ſame general Principles, or nearly ſo, though different in their Degrees, Mixture, and Proportions; ſo their Virtues correſpond and agree in the general; notwithſtanding that in many particular Diſcaſes, they ſometimes produce different Effects, and ſeem repugnant to each other in their Operations. But theſe Things, which are the Dictates of Experience, are no leſs obvious in reaſoning mechanically on the various Appearances that preſent in analyzing theſe Waters; as I promiſe myſelf, I ſhall be able to demonſtrate.

Upon examining the Waters of the three firſt-mentioned Fountains, I confeſs I was much ſurprized to find ſo ſmall a Quantity of Feces produced from them; and thoſe ſo taſteleſs and inſipid in their Nature. But, when I had tried them by Fire, and by that Means diſcovered the true Nature and Eſſence of their reſpective conſtituent Principles, and the Proportions they bare to each other; I concluded them to be of very little Account in themſelves; and no more than the Expreſſions and Teſtimonies of ſuch Principles exiſting in the Waters in a much greater Degree, and in a more ſpirituous, volatil, and excellent Nature. This Conjecture is not only very rational, but is likewiſe manifeſted by Experiment: For, did all the mineral Particles and Principles, as well the ſubtil and volatil, as the groſs and fixed, virtually remain in the Feces after Evaporation, they would, when reincorporated with the ſame Quantity of Water, which had been exhaled from them, contain the ſame Virtues, and exhibit the ſame Taſte and other Appearances as before; none of which do in the leaſt appear. This is a Proof drawn from Experiment; which is beyond all Arguments. But, becauſe it is agreeable, as well in Phyſicks as Mathematicks, to bring Matters of Fact, and Things evident to our outward Senſes, to quadrate with our Reaſoning; ſo I ſhall endeavour to diſcuſs it in that Light too.

It is univerſally maintained, That Nature is, in general, the beſt and moſt perfect Operator; and I preſume it will be allowed me that ſhe is, in particular, the beſt Chymiſt. Hence (without making the leaſt Digreſſion, to explain how and wherefore Things are ſo ordered and diſpoſed) it will appear, that the ſundry Minerals, and other Principles, with which theſe Waters are impregnated, muſt be conſtituted in the juſteſt Proportions, to obtain the Ends they are deſigned for. It will thence no leſs appear, that their individual Particles muſt be more perfectly elaborated, more infinitely divided, more intimately mixed,

mixed, more highly ſublimed, and, conſequently, their Virtues and Properties more perfectly unchained, rarefied, and diſplayed, than they could be by any human Art or Power.

It is this perfect Elaboration, this infinite Diviſion, and intimate Mixture of the Particles of different Species of Matter, that unchains the hidden Properties of Matter, and calls forth its moſt latent Virtues to Senſe and Action. In a Word, it is in the Perfection of theſe various Operations, that the Spirituoſity, Volatility, and Elaſticity of Bodies conſiſt. Thus we ſee, that by the Mixture of two Bodies, (each of which ſhall ſeem fixed and abſolutely void of Volatility,) the Mixture becomes volatil; and the Volatility, which reſults from the Mixture, will always be in Proportion, as the Elaboration, the Diviſion, and intimate Mixture of their Particles, are more or leſs perfect. Now, it is to be ſuppoſed that theſe volatil Particles or Eſſences did exiſt in the ſeveral Individuals before their Mixture; but were ſo fettered and impriſoned, as to be undiſcoverable by any of the human Senſes: For, *Nihil dat quod non habet*, is an Axiom which I believe no one will go about to controvert.

One Advantage of the volatil Eſſences, which ſo greatly abound in the *Spaw* Water, is, That they render and preſerve the more groſs, terrene Particles in a State of Comminution, Rarefaction, and Fluxion; and ſo prevent them from aggregating together, and precipitating. And this is ſo true, that if you expoſe any of theſe Waters to Heat, or let them ſtand ſome Time open to the Air, (that their ſpirituous, volatil Eſſences may diſſipate,) their more groſs, terrene Particles ſhall aggregate, and combine together: The more ponderous of which will ſubſide and fall to the Bottom, at the ſame Time that the lighter, and more tenacious or greaſy, riſe to the Surface, and appear in the Form of a Star. This Aſcent of tenacious, greaſy Matter to the Surface, in the Circumſtances juſt now mentioned, is more conſpicuous in the *Pouhon* Water, than in the others: But ſet any of them over a Fire, and the firſt Acceſs of Heat will immediately put them into a ſtrong Ebullition, even whilſt to our Senſation they are perfectly cold. Indeed, this Ebullition is greater, and manifeſts itſelf ſooner in ſome of them, than in others: But in all of them, the Inſtant they grow hot, their groſs, terrene Particles fall into Confuſion, and ſo aggregate and combine together, as to render the Water troubled and muddy: Which demonſtrates, what I have already obſerved, That the Exiſtence of the ſpirituous, volatil Eſſences in the Waters, is the neceſſary Condition of their Perfection, and their ſole Barrier againſt Corruption or Depravation: But when, by the Heat of Fire, Acceſs of Air, or Length of Time, thoſe ſpirituous, volatil Eſſences, and elaſtic Powers are diſſipated, That Water, which before was pleaſing to the Sight, as well as delightful to the Taſte, becomes extreamly nauſeous and offenſive, both to the one and to the other. The *Pouhon* Water, however, is not ſo ſubject to Decay by Length of Time, as the others; though equally ſo from the Acceſs of Air or Heat. As a Proof of this, Doctor *Cocquillet* aſſured me, that he and Doctor *Chrouet*, being conſulted together for a Patient in a wet Seaſon, (at which Times the Springs muſt be, and actually are very much diluted and weakened,) they compared together, approved, and accordingly ordered the Uſe of Waters, which had been bottled from this Fountain ſix and twenty Years before, preferable to thoſe, which then flowed from the ſame Source.

I flatter myſelf, the Arguments I have already urged, prove beyond Contradiction the great Volatility of theſe Waters: And I will now endeavour to make appear, in what Qualities and Degrees the ſubtil, volatil Eſſences, with which they are manifeſtly endued, muſt tranſcend the ſame Specific, through fixed and terrene Principles, from which they were themſelves derived.

It is very obvious to Reaſon, as well as evident from Experience, that two or more mineral, or other Principles, being mixed together and volatilized, their individual reſpective Parts are not only more infinitely divided, but are likewiſe more intimately mixed; and thence not only their own reſpective Virtues and Properties are greatly heightened in themſelves, but new and neutral Virtues may poſſibly reſult from that intimate Mixture and Union of their ſeveral Principles, which before were not proper or peculiar to either Individual. And this proves (what I have obſerved above,) that the Volatilization of different Principles or Species of Matter (being firſt mixed together,) unchains their reſpective Particles, and calls forth their moſt latent Virtues, as well as utmoſt Vigour to Senſe and Action. For, notwithſtanding what I have juſt now ſaid of new and neutral Virtues, which were not proper and peculiar to either Individual; yet they muſt be underſtood to have pre-exiſted in the Matter, though ſo fettered and intricated, as to be undiſcernable to the niceſt Scrutiny, 'till Volatilization had given them Birth.

But, beſides the ſuppoſed Superinduction of new Virtues, thoſe that manifeſted themſelves before in each individual Part of the Compound, are infinitely multiplied in Force, as well as Activity, by Volatilization. Hence it is, that whilſt the groſs, dull, terrene Particles require a formal and long Digeſtion in the Stomach, demand to taſte the *Bile* in the *Duodenum*; and after that, require many auxilliary Forces to thruſt them through the *Lacteals*; and yet a longer Time to concoct them in the Blood Veſſels, and to mix and incorporate them with the Blood: After all which long Apparatus, (by Reaſon of their ſlow Progreſſion and Inactivity,) they act perhaps by Piecemeal; without any Harmony or Concert: I ſay, hence it is, that whilſt the nauſeous Lump of groſs, terrene Matter (no leſs offenſive to the Palate, then oppreſſive to the Stomach) is going its tedious Courſe, the volatil Particles or Eſſences (on the contrary) have a Tranſition, as ſwift as Lightning. They no ſooner ſalute the Palate, than they enliven the whole Frame of the Body; which I, myſelf, as well as many others, have experienced. I have more than once faſted four and twenty Hours, on Purpoſe to prove the Effects of a large Draught of the *Pouhon* Water: When my Stomach was empty, and all the Blood-Veſſels and Glands cleanſed, and relieved from their undue Diſtentions; and all the groſs, ſpiritleſs, and excrementitious Humours thrown off by Perſpiration, and the other Secretions; and, in this Situation of Things, I muſt confeſs to have found admirable Effects from it: That is, I have immediately perceived my whole Machine greatly enlivened, and my Spirits much invigorated by it.

The Virtues and Properties of theſe Impregnations being, naturally and ſimply conſidered, very excellent; how extenſive muſt their Force and Power be, when we conſider the infinite Subtilty, Elaſticity, and Activity they acquire by Volatilization; eſpecially when mixed and complicated together? What Coagulations may they not be ſuppoſed able to diſſolve? what Combinations and Concretions of Matter not deſtroy? what Humours, whether acid, acrid, or corroſive, not correct? what Obſtructions not remove? what Relaxations not reſtore? and, finally, what Secretions not regulate? Experience confirms (what Reaſon in this Caſe plainly dictates) that all theſe great Ends are evidently and imminently effected by ſome one or other of them, when directed by the Advice of a good Phyſician, and with ſuch Preparatives, and other Aſſiſtances from Medicine, as are convenient.

SECT. II.

Treats of the various Ways of analyzing the Waters; of the ſeveral Principles, or Minerals with which they are impregnated; and their reſpective Virtues and Properties conſidered, both in a ſimple and a compounded State.

I will begin with the *Pouhon* Water; as well for its being the moſt eminent, and generally uſed, as becauſe it is the only *Spaw*

Water which is, or at leaſt, ought to be tranſported to *Britain*, and other foreign Parts.

The firſt Trials I made upon this Water, were by adding and mixing different Bodies with it; amongſt which I firſt uſed the known Experiment of a Gaul. By ſcraping ſome Gaul into it, the Water immediately turned of a deep purple Colour: But upon the Addition either of a little Quick Lime, Oil of Vitriol, or Spirit of Sal Armoniack, the borrowed Colour ſoon ſubſided, and the Water became clear as before. This purple Colour, produced by the Scrapings of a Gaul, proves a predominant Vitriol in the Water. I could make no further Diſcoveries, by any Experiments actually made upon the Waters, except the above mentioned, of a Gaul, and the Precipitation of its purple Tincture.

It is univerſally maintained (and indeed Experiments confirm it beyond all Doubt) that mineral Waters turning of a purple Colour, by projecting Scrapings of Gaul into them, always denotes a Vitriolic Impregnation. But what then (chymically ſpeaking) can be the Cauſe of the purple Colour's ſubſiding upon the Admixture of the various Things above named; and eſpecially the

Oil of Vitriol? I don't remember to have met with a proper Explanation of this *Phænomenon* any where, nor any Attempt to explain it; therefore ſhall endeavour to ſolve it here. And firſt of its Precipitation by Quick Lime. *Calx viva*, or Quick Lime, is a very powerful Alcaly: Whence it is no Wonder, that upon its being mixed with the Water, it ſhould immediately engage the acid, vitriolic Salts, keep them in cloſe Commerce with itſelf, and carry not only them, but likewiſe the Particles of the Gaul they had before aſſociated with, to the Bottom, and ſo leave the Water clear.

Spirit of Sal Armoniac is likewiſe an Alcaly of the volatil Kind; and being inſtilled into the purple Water, aſſociates itſelf with the acid, vitriolic Salts, ſo as to brake their Force: And thence the Particles of the Gaul, which were before held ſuſpended in the Water, and uniformly diffuſed through it, being freed and releaſed from their Vinculum, aggregate and combine together, and fall to the Bottom. As to the like Effect produced from the Inſtillation of Oil of Vitriol, (though in *prima Facie* it would ſeem a Paradox,) yet if we examine it cloſely, the Myſtery may perhaps be cleared up. I ſhall firſt premiſe, by way of Parallel, that many Diſeaſes are cured by Salts, ſome of the acid, and ſome of the alcalic Kind; when (if we credit many illuſtrious Writers of paſt Ages, as well as ſome of the preſent) the Diſeaſes were owing to the ſame ſpecific Salts, by which they were cured: So that in Fact, (allowing theſe illuſtrious Authors to be in the Right,) ſuch Diſeaſes were cured by increaſing the Quantity of Morbific Matter. The Caſe here is pretty much the ſame: For, though the Water was capable of retaining a certain neceſſary Quantity of Vitriol; of keeping it ſuſpended in it, and uniformly diffuſed through it; yet upon the Addition of Oil of Vitriol, the Water might be over charged with that particular Ingredient. And, as the Vitriolic Particles would neceſſarily come into a nearer Contract with each other; ſo they might aggregate, cluſter, and combine together, and fall to the Bottom; carrying the Particles of Gaul along with them. Or otherwiſe, the Oil of Vitriol, by its Tenacity, might firſt engage the Particles of Gaul aſſociated with the Vitriolic Principles of the Water; and afterwards by its Ponderoſity ſink them to the Bottom.

I had next Recourſe to Evaporation: By which Proceſs fifty Pounds of Water afforded ſix Drams of Feces, like a dry Powder, of a bright Cinnamon Colour, and not ponderous. I ſtrewed ſome of this Powder upon a poliſhed Iron Plate, made red-hot, and ſet over a Fire proper to keep it in the ſame Degree of Heat; but that Experiment produced nothing remarkable. It is a received Opinion, (and maintained by all the Writers upon this Water,) that it has a Sulphur in it: But if ſo, it muſt be a mere Eſſence of Sulphur; and that, in a very ſmall Proportion, which diſſipates imperceptibly. Every one that has gone through a Courſe of Experiments upon this Water, will, I believe, agree with me, That as it is not at all perceptible by the Taſte; ſo neither is it diſcoverable by any other Trials. Was there a Sulphur reſiding in the Feces, after Exhalation, it would liquify upon the hot Iron Plate; caſt a blue Flame, and a ſulphurous Smell; neither of which appeared in the leaſt, upon my Examination of it. In the above-mentioned Experiment, the Powder loſt a fourth Part in Weight: Nitre diſcovered itſelf in a conſiderable Degree, by a great Quantity of bouncing Sparkles. The Iron became very diſtinguiſhable in the Feces, after this Experiment; as alſo ſome Vitriol, and a ſubacrid Salt. Some Writers take a great deal of Pains to prove that there is Allom in it; of which, I own, I could diſcover no Marks. The Principles, however, with which it is evidently impregnated, are by no means inconſiderable: And theſe, when juſtly proportioned to each other, duly mixed, and perfectly ſublimed, may be ſuppoſed capable of producing very many and great Effects, without our being at the Pains to ſearch for the Diſcovery of Allom, or any Thing elſe to aſſiſt them.

It appears, as above, that the Principles, with which this Water is impregnated, are, Mars, Nitre, and Vitriol, with a ſmall Quantity of ſubacrid Salts; of all which, the Mars is the greateſt in Proportion. I will firſt enquire into their Virtues and Properties, as ſimple and ſeparate; and afterwards conſider them in their compounded and medicated State.

Mars or Steel, which, from its excellent Virtues and Qualities, claims ſo great a Share in the *Materia Medica*, is modelled and diſpoſed by Chymiſts into a vaſt Variety of Shapes; and by thoſe different Modifications, is rendered applicable to, and uſeful in very many and oppoſite Maladies. This is demonſtrable, beyond all Conteſt; and yet, if I may credit the Authority of Writers, as well as common Report, and the Teſtimony of my own Reaſon; that great Chymiſt, Nature, has, by one ſingle Preparation, fitted and qualify'd it to obtain all thoſe various and oppoſite Ends, in a far more eminent Degree of Perfection. For,

Mars or Steel, in its native Dreſs, diſplays its firſt Effects on the Stomach. It creates Appetite, by increaſing the Stomach's Attrition; and, when Appetite is the Effect of ſuch an increaſed Attrition, a good Digeſtion will certainly follow. But beſides theſe Benefits, (which it eminently procures to the Stomach,) it ſcowers and cleanſes it of Slime, and other Impurities; and, laſtly, greatly inſpirits it. Hence our Aliments paſs into the Blood better elaborated, and leſs diſpoſed to feed it with groſs, feculent, ſlimy, or other noxious Humours. This Mineral increaſes the attractil Force of every Moles of the Blood, and of all the Solids; at the ſame Time that it breaks to Pieces, and deſtroys all groſs, tenacious Concretions, and other Combinations; which may be either forming, or already formed in the Blood Veſſels, or elſewhere; and ſo, of neceſſary Conſequence, muſt open Obſtructions. It ſeems to communicate a Spirit to the Blood; and, in Reality, it does ſo; or elſe greatly actuates and invigorates thoſe already exiſting in it. And yet (which may ſeem ſtrange) it atchieves all thoſe great Ends and Purpoſes without any extraordinary Virtues and Properties viſibly inherent in it: But, it is ſuppoſed to act chiefly by Means of its ſpecific Gravity, and the Figure of its conſtituent Parts. That is, Firſt, by Means of its ſpecific Gravity, it attenuates the Fluids, and increaſes their *Momentum Motûs*; and, of neceſſary Conſequence, tends to break down and deſtroy (as obſerved above) all groſs viſcous Concretions or Combinations of Humours, which form and conſtitute Obſtructions in the Veſſels. And, laſtly, by the Figure of its Parts, it increaſes the Niſus of all the Blood Veſſels, and the attractil Force of all the other Solids: Therefore we ought not to wonder that very great and various Ends are obtained by the Complication and Joint-

Action of two ſuch Powers, as appear to be impreſſed, one on the ſolids, and the other on the Fluids.

It is not my Deſign to write a Treatiſe upon Steel in this Place; but I cannot diſmiſs ſo great and important a Branch of the *Materia Medica*, without taking a nearer View of it, by examining curſorily into its conſiſtent Parts, or firſt Principles; and the Manner of its Generation and Formation in the Bowels of the Earth. And, firſt, as to its Generation and Formation: It is, doubtleſs, like all other Minerals and Foſſills, produced by a regular and proper, though a ſubterranean Vegetation. This Doctor *Chrouet* (a Phyſician of that Country) aſſerts; but unluckily deſtroys his Theſis in the very Attempt to explain and prove it. After various Analyzations of this Mineral, he does not heſitate to aſſert, That the conſtituent Principles of Mars, is an Earth reſembling Potter's Clay, a very fixed Sulphur, and a double Salt; that is, a Salt partly acid, and partly alcaline. I will not pretend to deny that Mars is conſtituted of theſe Principles: Becauſe, as I have not been at the Pains of analyzing that Mineral; ſo I cannot judge what *Phænomena* might be preſent to favour ſuch an Opinion. But further, Doctor *Chrouet* is of Opinion, and peremptorily aſſerts, That the whole Bulk of the ſuppoſed conſtituent Principles aſſemble at once together, and ſo mix, and incorporate one with another, as not to be eaſily ſeparable; except only the acid, of which the Salt partakes, and which (for that Reaſon) he looks upon to be the grand Operator in the Formation of this Mineral. Things being thus ſituated and diſpoſed, he ſuppoſes the Air to deſcend upon the Maſs, and to inoculate or impregnate it: And there, by its intimate Commerce with the fixed Salts; to ferment, ſwell, and dilate the Maſs, like, as *Leaven* does *Dough.* By this Fermentation the various conſtituent Principles (ſays he) are more intimately mixed and interwoven with one another; and, conſequently, their Parts diſpoſed to come to a cloſer contact, and a ſtronger Union: And, laſtly, (if I have comprehended the Doctor's Meaning, for he does not expreſs it,) by the ſuppoſed Fermentation, its Fibres are rendered ſo ſtrong and elaſtic, as that the whole Maſs contracts itſelf together into a cloſe, compact Body, to the Expulſion of the interpoſing

Air; and ſo the true Marcaſite of Steel remains.

This, indeed, is a very ſpecious, or rather vociferous Definition, (though in my Tranſlation I have much abridged and curtailed it;) and it is ſupported by a good deal of the Chymical Bombaſt and Jargon. I declare it is no ſmall Mortification to me, that I muſt again differ from Doctor *Chrouet*, and diſſent from him, in this his ſo learned and laboured Definition. But, as I cannot ſacrifice my Reaſon to a Ceremony, nor proſtitute it to Flattery; ſo I can by no Means diſpenſe myſelf from it. Whether, or not, the Doctor, in his ſeveral Analyzations of Mars, did really diſcover ſuch *Phænomena*, as would lead a reaſonable Man to think it compoſed of the Materials, and in the Manner he aſſigns, I will not venture to ſay: But I rather incline to believe he was led into this chymical Way of defining it, from the Prejudices and Attachment he might have to the obſcure and myſterious Part of that Art, (which is no where ſo much eſpouſed and cultivated as in *Germany*;) and perhaps, to ſhew himſelf an Adept in it beſides. But, be that as it will, I ſhall proceed to deliver my own Sentiments upon it; which are intelligible, plain, and (I hope) natural.

My Sentiment upon the Matter is this: Allowing thoſe Principles to conſtitute Mars, which Doctor *Chrouet* lays down as Fact, I would ſuppoſe it to be brought to paſs by the following Mechaniſm, *viz.* That when, or whereſoever thoſe Principles meet together in a proper Matrix, and ſtrike each other at proper Angles, they inoſculate, unite, and are intimately interwoven together, and ſo aſſume a new Form and Denomination. And thus may be formed the firſt Seeds or Rudiments of a Mine, or mineral Bed; which may enjoy Virtues and Properties, as well as a Form and Subſtance, that did not viſibly pre-exiſt in either of the Individuals; and theſe Seeds, or Rudiments, being thus formed and diſpoſed, might daily vegetate, and increaſe in Bulk. They would not vegetate, indeed, like as Plants and Trees do, which receive their Nutriment through the fine Tubes of their Roots and Seeds, but by a Kind of Vegetation, which is peculiar and proper to themſelves; in common with other Minerals, perhaps. But, though I don't abſolutely deny and reject Doctor *Chrouet*'s *Hypotheſis*, yet, I confeſs, I am more inclined to favour another. That is, I am of Opinion, that Mars or Steel is not a Body compounded of various Principles; but that all its conſtituent Parts are ſimple, genuine, and of original Exiſtence; and that theſe Parts, or Particles, (conformable to the eternal and immutable Laws of Attraction,) as they approach nearer together, do incline more violently to each other, till at laſt they unite and combine together in one Maſs; which Maſs continuing to act in like Manner (in Obedience to the ſame attractil Property) upon all ſuch homogeneous, or ſimilar Particles as paſs over, or approach near it, does daily vegetate or increaſe in Quantity; 'till in Proceſs of Time, large Mines, or mineral Beds, are formed: And this I hope will be judged more conſiſtent with the true Nature and Doctrine of mineral Vegetation, than Doctor *Chrouet's* Hypotheſis. Moreover, that great Operator [Nature] is not more excellent and admirable in the Formation of this Mineral, which ſhe renders ſo ſolid and compact, as in a Manner to conceal its Virtues from our external Senſes; than ſhe is in ſeparating again, in diſſolving, mixing, and ſo rendering it applicable to a Multitude of medicinal Uſes; in which it diſplays ſurprizing and almoſt infinite Virtues.

But here I proceed to the Conſideration of Vitriol.

Vitriol is commonly counted a Semi-Mettal, it being a Salt, which has poluted itſelf by engendering with ſome Mettal or other. But however unchaſt and polute it may be in its Commerce with different Species, it is nevertheleſs excellent in its Nature and Uſes. And, firſt, it greatly corroborates the Stomach and Guts; it reduceth their relaxed Fibres; and by contracting and reſtoring the Orifices of ſuch Glands, as were too lax and open, it repreſſes a redundant Phlegm and Slime in the Stomach and Bowels; and ſo becomes an Acceſſory to the Promotion of Appetite and Digeſtion. It opens Obſtructions, by heating and attenuating the Fluids; and ſtops Fluxes, by aſtringing the Solids. Its Virtues and Uſes, ſhould I enumerate every particular, are very many; but theſe are much increaſed, as well in Number as Degree, when it is complicated with Mars.

Nitre is a great Cleanſer of the Conduits and Veſſels of the Body, and tends to purifying the Blood: It incides and attenuates all greaſy, ſlimy, tenaceous Humours; and by that Means removes Obſtructions: It divides, and deſtroys their Coheſion and Union, by penetrating them with its ſharp Points: And, laſtly, precipitates the Matter by Urine; and in that Operation, it likewiſe ſcowers and cleanſes the Reins and Ureters.

The ſubacrid Salt, which is produced upon the Analyzation of this Water, is in a ſmall Quantity, that it ſcarce deſerves Notice. However, in Proportion to its Quantity, it muſt be very aperient, deterſive and cleanſing.

It appears from what has been ſaid of theſe individual Principles, that they are all and each of them ſhaped to the ſame general Ends and Purpoſes, though they affectuate them by different Ways and Means. And thus far Nature is juſtified, who is ſaid to be right and uniform in all her Operations; as ſhe has not complicated and blended together Things which are oppoſite and repugnant to one another in their Natures and Effects.

When theſe various Principles are (by her) brought into a perfect Union, and are not only intimately mixed and united, but wrought up (by the ſame Hand) to the utmoſt Degree of Sublimity and Volatility; what new Virtues and Properties muſt they not acquire? and to what Degree may they not increaſe thoſe that pre-exiſted? Here it is, methinks, in this Situation of Things, that I can palpably trace and diſcover all thoſe great, various, and even oppoſite Effects, which are produced by the Waters of the *Pouhon*; and which (notwithſtanding they are obvious from daily Experience) ſeem to have ſtaggered the Reaſon of ſuch Perſons as have hitherto wrote upon them.

Doctor *Neſſel*, (another Phyſician of that Country,) when he is ſpeaking of the great Virtues and Effects of theſe Waters, (though proved by him experimentally in numerous Inſtances,) anticipates to himſelf the Railery of the World. He ſuppoſes every one will account what he is about to relate apocriphal, if not paradoxical. Again, he ſuppoſes that the Almighty had impreſſed an intelligent Spirit on them; by Virtue of which, the Waters knew preciſely, upon what Parts, or Humours they ought to act, excluſive of, and abſtracted from all the reſt. He fears the World will think him very romantic, when he ſays they are both hot and cold, moiſt and dry. And, indeed, well it may:

For they are not actually ſo, (as he ſeems to imagine,) but only virtually. He expects to find but a few Believers, where he ſays they heat what is two cold; and that they cool what is too hot; that they dry up a redundant Moiſture; and moiſten what is too dry; that they open what is too conſtipated; retract and reſtore what is too much relaxed, &c. But why all this Aſtoniſhment? Why muſt we ſuppoſe all theſe Effects, and Operations to ariſe and proceed immediately from the Direction and Influence of a ſupernatural Agent? Certainly this Gentleman never made any Appeal to his Reaſon; or elſe, ſurely, he would have been able (in ſome Meaſure at leaſt) to have diſcerned the Cauſes of all theſe Operations and Effects in a rational Light. For my own Part, I ingenuouſly and ſolemnly declare, that though my Senſes were not convinced in all theſe Particulars; yet my Reaſon (informed by their Analyzation) would readily have ſuggeſted them to me in Favour of theſe Waters.

To ſum up all in few Words: I have diſcerned ſuch Virtues and Qualities in the *Pouhon* Water, as lead me to believe, that by a juſt, regular, and due Uſe of it, it is capable of curing very many and great Diſorders ;and, finally, of reſtoring the juſt Ballance of Nature, of bringing all the particular Faculties and Functions of the human Conſtitution to a juſt Equilibrium ; which, as it is the moſt certain Cure for many Diſeaſes, ſo it is the beſt Barrier of Health. Here I take leave of the *Pouhon*, and proceed to the *Geronſter*.

In examining the *Geronſter* Water, I went through all the ſame Experiments, as upon the *Pouhon :* And afterwards I put it to the Wreck in divers other Manners. But, before I relate my Experiments, it will be proper to obſerve, that this Water is highly impregnated with a ſulphureous Vapour or Eſſence ; as is manifeſt to the Taſte and Smell ; beſides, other Circumſtances, which ariſe immediately upon drinking of it, plainly ſpeak the ſame Thing. This Vapour or Eſſence muſt neceſſarily be extreamly volatil, ſince it inſtantly diſſipates upon the leaſt Acceſs of Heat. People, ont heir firſt taking this Water, are uſually affected with ſulphureous Belchings ; after they have drank a few Glaſſes of it. This is what I my ſelf have frequently experienced ; and as oft as I have belched after drinking them, it has been attended with a very odd Perception; like as if a Flaſh of Gunpowder iſſued from my Stomach.

I firſt tried it with a Gaul; which being ſcraped very fine, and put into it, tinged it of a purple Colour; but upon mixing a few Drops of Oil of Vitriol with it, this borrowed Colour ſoon ſubſided. I had next Recourſe to Evaporation: By which Proceſs I extracted three Drams and one Scruple of a deep Cinnamon-coloured Oker, from five and twenty Pounds of the Water. This Powder likewiſe, affordeth but very little Taſte, and differed from that of the *Pouhon* in nothing, ſo much as in the Colour and Quantity; though, indeed, but very little in the latter. When this Powder was taken out of the Evaporating Veſſel, I perceived all around and about the Bottom of it a white ſaline Matter, which we could not ſcrape off without Difficulty. This I judged to be an alumenous or vitriolic Salt, which (being not ſo intimately mixed and incorporated with the Mars and other Principles) ſeparated in boiling, and by its Weight precipitated, and fell down ſooner than the other Feces. Indeed, it is evident that the Mars is not ſo perfectly blended and incorporated with its Fellow-Principles in this Water, as in the others; and conſequently, it is more genuine, diſtinct, and ſeparable; which will plainly appear from the following Experiment. I gathered ſome of the Ruddle, or reddiſh earthy Matter, which gradually adhers to the Stones in the Fountain; but more eſpecially to thoſe it paſſes over, as it runs from it. This I judged more proper for any Experiment of this Nature, than the Feces remaining after Evaporation; becauſe the former is a pure and natural Concretion, or rather gradual Gathering of the more groſs, terrene Particles, free from the Alteration and Deſtruction that Fire muſt undoubtedly produce upon the latter. This earthy Matter, which to Sight appears a ſort of Iron Ruſt, and would incline one to think the Water impregnated with little elſe, were it not for its Lightneſs in Weight, as well as Greaſineſs, and the ſaltiſh Taſte that it imparts: This earthy Matter (I ſay) being calcined gently on a poliſhed iron Plate, or in a Crucible, all its ironiſh Parts eaſily detach themſelves upon the Approach of a Loadſtone, and adhered to it. Which did not appear in the like Experiments made on the Feces of the other Waters. Hence we are inſtructed that the Mars, contained in this Water, is not ſo much fettered and entangled with its Fellow-Principles, as in the others. The Feces remaining, after the ironiſh Particles were thus extracted by the Magnet; being boiled in rain Water, and then filtered and exhaled; there remained a ſmall Quantity of a bitter, piquant Salt, of the neutral Kind. This Water, then, manifeſtly contains a redundant ſulphureous Spirit or Vapour, as appears both from the Smell and Taſte, as well as from other Circumſtances already mentioned; a good Quantity of well elaborated Mars, not intricated and confuſed with the other Principles; ſome Vitriol, as is apparent from the Tincture it receives by the Gaul; and an alcalic, fixed Salt. I call the Salt alcalic, though in Reality it is neutral; becauſe the alcalic Quality greatly predominates over the acid. How many, and what great Virtues and Properties muſt neceſſarily be contained here? And what Effects may we not expect from theſe Principles, juſtly proportioned, intimately mixed, infinitely divided, and, laſtly, ſublimed to the higheſt Degree of Volatility?

Mars and Vitriol I have already explained upon; and it would be unneceſſary to ſpeak of Sulphur in this Place, were its Virtues as well underſtood, as they are univerſally allowed. To ſpeak then of Sulphur: It is a moſt powerful Purifier, and a conſiderable Rarefier of the animal Juices: It attenuates, diſſolves, and deſtroys all groſs, tenacious, and viſcous Combinations: It reſolves all morbid Concretions, by diſſolving, or otherwiſe deſtroying their Cement; and is equally good in many acute, as well as chronical Diſeaſes: It cures all cutaneous Diſtempers, whether recent or inveterate: It levels (in general) all ill Humours, whether acid, acrid, or corroſive: And if there be any Humours ſo ſtubborn as to reſiſt a compleat Diſſolution, Correction, or Expulſion, it will ſo work upon them by Digeſtion, as greatly to enervate and unarm them. And this it effects by filing off, and blunting their Points; and ſo rendering their acute Angles obtuſe and offenceleſs. But ſhould only the firſt Character or Quality, I have aſcribed to Sulphur, be granted me, *viz.* That it is a great Rarefier of the Blood; it would be eaſy to prove the Neceſſity of all the reſt, from the ingenious

Doctor *Morgan's* Explanation of the Laws of the Motion and Secretion of the animal Fluids. * Beſides theſe, it ſoftens the too-rigid Veſſels and Fibres, and promotes Perſpiration. And, finally, (to end where I ſhould have began,) it warms and comforts a cold, weak Stomach, and reſtores its decayed Ferment.

The fixed Salt, diſcoverable in theſe Feces, is what now demands to be ſpoke to. This Salt ſeems calculated to make the Compoſition truely perfect and harmonious: This is wonderfully adapted to precipitate and carry off by Urine, thoſe Humours which were wrought upon and prepared by the Sulphur, Mars, *&c.* Beſides this, it may have, and undoubtedly has many inherent Virtues, which are peculiar to itſelf; and it may be qualified to act on ſome Species of Humours, which none of the other Principles could touch. For, though their Virtues are really very great and numerous, yet I don't pronounce them Panaceas. When ſpeaking of Sulphur, *e.g.* I ſaid it levelled in general all ill Humours, whether acid, *&c.* That is to be taken in a comparative Senſe. This Salt is a powerful Bitter, and conſequently a Promoter of Digeſtion: It reſolves and attenuates the Fluids by its Subtility, and Piquancy of its Points; and for the ſame Reaſon, muſt deterge and cleanſe the Glands and Blood-Veſſels; eſpecially the latter, and the ſmaller. Now, when by the Joint-Force and Action of theſe Principles and Powers, all the ill Humours, whether acid, acrid, or corroſive, are corrected; and all the groſs, ſlimy, viſcous, and tenacious, are reſolved, and the whole deſtroyed, or diſcharged; it is not improbable, but all thoſe happy Effects, I ſhall hereafter mention, may enſue.

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* Philoſophical Principles of Medicine

In examining the *Sanveniere* Water, my firſt Eſſay was by Exhalation; by which Proceſs fifty Pounds of the Water yielded me five Drams and a half of Powder, of a brighter Colour, though in Weight and Taſte nearly reſembling thoſe of the Waters already mentioned; but this Powder, being calcined upon an iron Plate, the greateſt Part diſſipated in bouncing Sparkles, like Nitre. There remained, after the Experiment, an acrid, picquant Salt; which, upon a cloſe Examination, we found had corroded the Plate.

Doctor *Chrouet* relates an Experiment which I had not Time to make myſelf; and therefore, for the preſent, muſt take it upon Truſt. He reports to have put twelve Drams of that red earthy Subſtance (which adheres to the Stones over which the Water paſſes) upon an iron Plate made very hot, and that it immediately ſparkled violently, (I ſuppoſe like Nitre, tho' I have not the Doctor's Word for that,) and ſpread a truly ſulphureous Smell for the Space of two or three Minutes. But, when theſe Appearances were over, and the Smell of Iron began to take Place, he remov'd it from the Fire, and found it diminiſh'd three Drams in Weight; which aſſur'd him that it contain'd one fourth Part Sulphur. After this (adds he) the *Magnet* attracted it very readily, and it turn'd a Tincture, given by a Gaul, blackiſh; which it has been obſerv'd not to do, when kept a longer Time upon the Fire; becauſe the Texture of its Mars being very looſe, the Fire would eaſily conſume its metallic Sulphur, and ſo entirely deſtroy the Metal: Whereas, being (on the other Hand) but a little while expos'd to the Fire, it only conſum'd its exterior, groſs

Sulphur, which before hinder'd the Force and Action of the Loadſtone upon the Mars.

Hence it is evident, that the chief, if not the ſole Impregnations of the *Sanveniere*, are Mars, Sulphur, and Nitre, with a ſmall Quantity of an acrid, vitriolic Salt: But, how well Doctor *Chrouet*'s Experiment quadrates with his own Reflections upon it, I leave the World to judge. He ſays, That putting the Matter upon a red-hot iron Plate, it immediately ſparkled very much, and caſt a ſulphureous Smell for the Space of two or three Minutes; and after that, weighing the Matter again, and finding it one fourth Part diminiſh'd, he does not heſitate to charge the whole Conſumption upon the Sulphur, and makes no Account of the nitrous Particles that firſt detach'd themſelves from the Maſs in the Way of bouncing Sparkles.

It would be needleſs in this Place, to ſay any Thing of the Virtues and Properties of Mars and Sulphur, as being the principal Minerals with which this Water is impregnated; (having already been pretty copious on each.) However, I cannot omit to add in Favour of Sulphur, That its balſamic, ſoftening Quality, coacting with the penetrating, diuretic Nature of the Nitre, and the deterging, cleanſing Property of the Mars, muſt neceſſarily qualify it to effect thoſe great Ends and Purpoſes, for which I ſhall hereafter recommend it. This Water, being reputed very cold, I tried it with a Thermometer; which (being firſt filled with rectified Spirit of Wine) I plunged in the Water, and held it there about five Minutes; after which, taking it out again, I found the Spirit condenſed about a fiftieth Part.

The three other Fountains, *viz.* the little *Sanveniere* or *Groesbeeck*, the *Tannelet*, and the *Wartroz*, are truly Sources of very delightful Waters, and have ſome perceptible Differences from each other; but they are now almoſt out of Date, and quite out of Uſe. The *Wartroz* has a purgative Quality: There is yet one Thing (as I have been well aſſured by credible Perſons) common to all the mineral Fountains about *Spaw*: It is this; Take an Eel, or any other Reptil, and plunge into it; it gives a Spring, and dies immediately.

I will now enter upon my third, and laſt Section: Wherein I ſhall endeavour to appropriate and direct the great Virtues and Properties, I have aſcribed to theſe Waters, to their proper and reſpective Diſeaſes.

SECT. III.

THE Waters of thoſe three admirable Fountains, the *Pouhon*, the *Geronſter*, and the *Sanveniere*, though they have ſome Virtues and Properties in common with each other; yet have they others which are diſtinct and peculiar; and in ſome Caſes, they even produce Effects directly oppoſite and repugnant to each other: But this is no leſs obvious to Reaſon, than it is evident from Experience; as I ſhall make appear, when I come to explain mechanically upon the Virtues and Properties of each Water; deducing them from the Conſideration of their reſpective, individual, conſtituent Principles, with which they appeared (upon Analyzation) to be impregnated.

The *Pouhon* Water appears evidently to be greatly impregnated with Mars, Vitriol, and Nitre. Some Phyſicians and Authors contend very obſtinately, that there is both Sulphur and Alom in it: But, as I could diſcern no Marks of either in its Analyzation; ſo I ſhall conſider them no further, than only to obſerve, That ſhould there be ſome Sulphur, its Proportion is ſo ſmall, (compared with the other Principles,) as to be almoſt out of the Queſtion. Beſides, the Uſe and Experience of this Water, in many Caſes, (as I am credibly and well informed,) are equally tacit concerning a Sulphur, as the Examinations I paſſed upon it; and, as I have already hinted, thoſe three cardinal Principles being granted, in that Juſtneſs of Proportion, ſo intimately mixed and incorporated, and ſo highly ſublimed, as they evidently appear to be; I need not rack the Water, or my own Brains, to find out new Ones.

I have already ſpoke of the Virtues and Properties of theſe three Principles taken ſeparately: I ſhall now proceed to conſider them in their compound State. And,

FIRST, The Mars and Vitriol are wrought by Nature into a perfect Vitriol *Martis* of the moſt ſublime and excellent Kind. This

Compound beſpeaks many, and very great Virtues and Uſes: But then, being intimately mixed and incorporated with Nitre, its pre-exiſting Virtues muſt neceſſarily be increaſed, as well in Number as Degree. This happy Confederacy of Principles, by their Joint-Force and Action, are capable either of raiſing or reducing the animal Oeconomy to, or ſupporting it under a juſt Regulation. They are capable either of ſearching or guarding it, from their firſt Entrance at the Mouth, through its moſt intricate Meanders and Labyrinths, to its moſt remote Outlets They are calculated, and qualified to diſtribute impartial Juſtice every where. They can raiſe and inſpirit what is weak and languid; curb and ſuppreſs what is too luxuriant. They can force open and cleanſe thoſe Ducts and Canals, which are choaked up with Filth, or otherwiſe obſtructed; contract and reſtore thoſe that are relaxed, and too much dilated.

But to proceed regularly.

I ſhall, (for Method's ſake,) *Firſt*, ſet forth how, and by what various Ways and Means this Water acts upon our Conſtitutions. *Secondly*, How, and by what Mechaniſm, it produces the various Effects aſcribed to it. *Thirdly*, In what Diſeaſes it is particularly proper and uſeful; and in what improper and pernicious.

Its firſt Action is upon the *Primæ Viæ*, or what we call the alimentary Duct, as far as to the Stomach; though, indeed, if drank in large Draughts, and at ſhort Intervals, its Action will reach the Guts likewiſe; where, by its Coldneſs and Weight it ſtrikes forcibly on all the interior Glands and Fibres, ſo as to contract them very vigorouſly; its ſubtil, volatil, elaſtic Spirit acting at the ſame Time with a Stimulus, not only co-operates to the ſame End, but it likewiſe penetrates their Orifices, and gets immediate Paſſage into the Blood, by piercing through, or breaking down any ſlimy, viſcous Humours; which, ſticking in and clogging the recipient Tubes, might obſtruct its Enterance. The above ſuppoſed Action, which is thus communicated to the interior Glands and Fibres of the alimentary Duct, by the Coldneſs and Weight of the Water, and the Stimulus of its volatil Particles, (not to mention the increaſed Attrition of the Stomach, which will contribute a good deal to the ſame Ends,) is continued with a proportional Diminution to the very Superficies of the Body; when at the ſame Time the ſubtil, volatil, elaſtic Particles, which e're now have penetrated the recipient Tubes, and got Acceſs to the Blood, are co-aſſiſting to the ſame End, by invigorating the Blood and Spirits, and teaching the exterior Solids, as well as the whole artereal Syſtem, to re-act proportionally to the increaſed Force they receive from within. We are here to conſider, that by this Time (for this complicate Scene is not long in Acting) a great deal of the more groſs, as well as volatil Elements have inſinuated themſelves into the Blood; and that their Virtues and Forces are joined together, and diſpoſed in Action. Here, may we diſcern a triple Power in Alliance and Joint-Action together. All the Solids are ſtirr'd up to Action by the Weight and Coldneſs of the Water ſtriking upon them; whilſt the Blood and animal Spirits are actuated and rarefied by the volatil, elaſtic Principles contained in it, which get immediate Acceſs to them; and by this Time, all the Parts and Principles of the Water, as well the groſs and terrene, as the ſubtil and volatil, are uniting and levelling their utmoſt Force, to correct or alter, attenuate or diſſolve, break down and deſtroy, all ill Humours, whether acid or acrid, groſs or ſlimy, viſcous or glutinous, which may happen to lie in their Way, and obſtruct or interrupt their rapid Motion. The whole Frame of the human Fabric, thus co-operating with the medicinal Virtues of the Water; thoſe great Ends and Purpoſes will very probably be obtained, (as Experience teſtifies they often have been,) which neither the ſame, nor any other Principles, in any other Form or Diſpoſition, could accompliſh. But further; whether the Ends deſired are perfectly obtained, or not, the Conſtitution certainly fares the better for it (to the Exception of a very few particular Circumſtances.) For it is the peculiar happy Property of theſe Waters to act in Conſervation of the human Frame, and not to its Deſtruction; which is the ill Faculty of but too many Medicines given in other Forms.

It may by this Time, perhaps, ſufficiently appear from the Natures and Properties I have aſſigned to theſe Waters, as well as from their Operations, that they do, and indeed neceſſarily muſt act in Preſervation of the human Frame, with all its particular Faculties and Functions, and not to their Deſtruction or Depravation: And was it not that I ſhould degrade what I am intimately concerned about, and intereſted in, (that is, the Practice of Phyſick,) I might with equal Eaſe and Certainty ſhew, that other Forms of Medicines (ſome of them at leaſt) act to very different Effect, that is, to their Deſtruction, and not to their Preſervation; except only, when they are directed by a Phyſician truly judicious in Medicine, as well as penetrating into Nature; which, I may venture to ſay, are not the Portions of every one amongſt us. I ſhall readily be underſtood to mean here, all Medicines of the Galenical or Chymical Tribes, directed or applied by ſuch Perſons, who, for want of a due Knowledge, either natural or acquired, or both, are incapable to form any juſt Judgment, either of the Nature of a Diſeaſe, or of the Intentions of Cure; or, laſtly, with what Inſtruments to execute ſuch Intentions. And if theſe Medicines, which have a ſtrong and violent Operation, ſhould (as it's odds but they will) miſs of their Aim, and produce no good Effect on the Matter or Humours conſtituting the Diſeaſe: Theſe will evidently remain the ſame, or perhaps be aggravated, whilſt the poor Conſtitution is the Sufferer; and which being thereby greatly debilitated and extenuated, falls a Victim to the Enemy.

The late learned and accurate Doctor *Freind*, in his *Hiſtory of Phyſick*, very juſtly cenſures ſome of our ſyſtematick Phyſicians of the preſent Time: Theſe Men (he tells you) purſue their own Notions and Chimeras in Phyſick, in Contempt and Neglect of all the ancient and modern Writers in that Science. Strange Arrogance! That this or that Man ſhould implicitely believe and prefer his own Whimſies and Conceits, ſo far as to diſdain ſearching for farther Information, or drawing any Succours from paſt Ages. But Doctor *Freind* has treated this Subject in ſo maſterly and convincing a Manner, and has ſo ſhortened every Man's Labour of this Kind, by culling out, and ſevering from the voluminous Chaos, ſuch Books only as are peculiarly proper and uſeful to be read in the ſeveral Branches of Phyſick, that I hope, in Time, we may have the Satisfaction, and the World the Benefit of ſeeing theſe Gentlemen become his Proſelytes.

The very learned and juſtly-renowned Doctor *Boerhaave*, Profeſſor at *Leyden*, has laboured more happily and effectually towards reſtoring the Practice of Phyſick to its primitive Purity, than any other Perſon, (that I know of at leaſt,) either in the preſent or ſeveral Ages paſt. He, indeed, is a Mirror of Perfection in every particular Branch of it; and the Merit of his Labours is rewarded with the univerſal Teſtimony and Approbation of all the learned World. His Labours, Diſcoveries, and Improvements in Chymiſtry, have of late appeared in Publick, and are very juſtly acknowledged to be ſtupendious, and to excel every Thing extant upon that Subject. The ſame Harmony, Purity, Truth, and Chaſtity, are alike conſpicuous in his Practice and Theory. *Expertus loquor*: For I have the Honour of ſome Acquaintance with both. The Lectures he utters to the Pupils in his Colleges, excel (perhaps) any Thing to be met with of that Nature: They are ſo clear, perſpicuous, orthodox, and inſtructive, that

I will venture to ſay, if amongſt the great Number of young Phyſicians that liſt under him yearly, any go away unduly qualified, it can only be owing to their own Inattention, or Incapacity to digeſt and turn them into ſalutary Nouriſhment.

Doctor *Morgan*, in his Preface to the excellent Book above quoted, ſtrenuouſly urges another Branch of Learning, which to ſome perhaps may ſeem a little foreign to Phyſick, as indiſpenſably neceſſary towards the forming a good Phyſician: And, indeed, He finely illuſtrates the Uſe of it in the Text of his Book. This is the Science of Mathematicks; and therein particularly Arithmetick, Geometry, and Algebra; upon whoſe Baſis and Principles he requires that a competent Knowledge of the animal Oeconomy, with its Laws of Motion, &c. ſhould be founded.

An accurate Acquaintance with Matheticks, is indeed abſolutely neceſſary to the perfect Attainment of many Arts and Sciences: But, I apprehend Doctor *Morgan* lays too great a Streſs upon it, with Regard to Phyſick. It is certainly, however, a good Baſis, as well as an Ornament to Phyſick,

ſick, when it does not interfere with Things of greater Uſe and Importance. But then, ſurely, our chief Endeavours (after having attained to a due Knowledge of what we call the *Leges ſcriptæ Medicinæ*) ought to be employed about cultivating and improving the natural Genius; or in acquiring an Aptitude and Facility to ſolve all the *Phænomena* of Nature, eſpecially all thoſe incident to the human Body: That is, its various Diſeaſes and Diſtemperatures.

I would not, however, be thought to contemn or diſregard the Science of Mathematicks; but rather admire and recommend it: As it's not only uſeful, but ornamental to that of Phyſick; and as it ſtrengthens and enobles the human Mind. But then, I would obviate its Subordination to what is really more eſſential: That it ſhould be ſought, indeed; but in that Order of Time and Degree of Meaſure, which are proportional to the Weight and Uſe it carries in Phyſick. What I particularly contend for, and would give the Precedence to, is mechanical Knowledge: And I preſume it will be allowed me, that mechanical Knowledge did precede the mathematical in Point of Time, as it now does in Excellency and Extent. For, mathematical Knowledge ſerves only to explain and demonſtrate the mechanical or rational: And ſhould the mechanical or rational want that Demonſtration; it may nevertheleſs be true, ſubſtantial, and uſeful. But (*vice verſa*) a Man of the moſt conſummate mathematical Knowledge, may be incapable of ſolving, in a mechanical Light, the ſimpleſt *Phænomenon*, which lies without the Sphere of his paſt Experience, or what he had never heard debated. And this leads me to applaud the Poet, — where he ſays — *Fælix qui potuit rerum cognoſcere cauſas.* Furthermore, it will appear, that mathematical Knowledge is (in a comparative Senſe) narrow and bounded; but the mechanical is liberal and univerſal: It takes every Thing into its View. And the Phyſician, who does not (though I hope and believe many do, indeed) conſider every Diſeaſe in a mechanical Light; with Regard to its Nature, Eſſence and Intentions of Cure, is, *de Facto*, no more than an Emperick. On the other Hand; I preſume the greateſt Advocates for Mathematicks, or Adepts in it, ſeldom appeal to it in their Reflections on Diſeaſes, or make it in any wiſe the Rule and Standard of their Practice. And hence I infer, that mathematical Learning, without a natural Aptitude and Capacity to reaſon mechanically about Things, will be of but little Service in Medicine; whereas the latter, without Mathematicks, may be of a great deal.

I am not (however) about to derogate from Doctor *Morgan*'s Performance. No! But far otherwiſe. I profeſs to admire it; and account it very excellent. The Book beſpeaks, not only the accurate Mathematician, and One well acquainted with the animal Oeconomy, but the Man of a fruitful and fine Invention likewiſe; and is ſuch as muſt ſecure the Approbation and Eſteem of all Men of uſeful Learning and ſound Judgment, both to it ſelf and its Author. But, to wave this Argument; Would all Phyſicians, or rather Students in Phyſick, be directed by Doctor *Freind*, in ſo important a Point as he urges to them; we might in Time, not only arrive to ſome Degree of Perfection, but to a Uniformity in Practice likewiſe: Whereas at preſent we are the moſt variable, as well as inconſiſtent Set of

Men living. We are not only one Day, but in one Place or Country, Peripateticks; in others Epicureans: Here Galeniſts; there Chymiſts: Every Age, or Country, new modelling the Art, and adapting it to its own Scheme and Caprice. Hence, it's no Wonder that the Profeſſion is ſcarce advanced ſince its Infancy; and that Theories and Practice ſhould ſo vary amongſt the Learned. But here I finiſh a long Digreſſion, and reſume my Story.

The mineral Waters, in and about *Spaw*, but more eſpecially the *Pouhon*, enable Nature's Self to work, at the ſame Time that they put Tools into her Hand to work with: And to ſuppoſe the worſt of theſe Waters; Though this or that Diſeaſe in Queſtion ſhould not be compleatly cured by their Uſe; (which will very rarely happen, where the Patient exactly conforms to the Dictates of a judicious Phyſician,) it is a great Chance, but ſome other latent Diſeaſe is prevented: For, it is their peculiar Prerogative to preſerve the whole human Frame under its due Regulations: To reſtore its loſt or decayed Ballance of Power, and to bring every Thing into a juſt Equilibrium. And it is by theſe Means, chiefly, that they cure ſo many, ſo great, and ſo oppoſite Diſeaſes.

I ſhall in this Place, endeavour to reconcile all thoſe myſterious *Phænomena*, which have appeared ſo ſtupendious and unconceivable to ſome Phyſicians and Writers upon theſe Waters, and render them familiar and intelligible to the meaneſt Capacity: And, inſtead of being ſtaggered at their real and obvious Effects, prove from their conſtituent Principles, and the Laws of Mechaniſm, that the like muſt neceſſarily come to paſs.

The Science of Phyſick, in general, is dark and intricate enough; but ſuch *Phænomena* as theſe, are particularly abſtruſe and unintelligible; and I don't at all wonder they ſhould appear Myſteries and Riddles to ſome amongſt Us. For, though there are many who practice Medicine, that either by Accident, Intereſt, or Stratagem, acquire and eſtabliſh Characters in the World; yet, I will be bold to ſay, not all of theſe are equal to ſo important and perplexed a Task. It has been often remarked, (and indeed it's what muſt recur to the Memory of every curious Obſervator,) that ſome Gentlemen of the Faculty have bribed the publick Vogue, and ſtepped into high Repute, by Means of a huge Heap of learned Lumber, which they have acquired at immenſe Pains, on Purpoſe (perhaps) to cover and conceal their Defects of natural Genius. This, indeed, is what always captivates the Opinion of the Vulgar; who obſtinately refuſe to ſee any Imperfection under this Veil: But nevertheleſs, ſuch Men have often been found the moſt egregious Ideots in reaſoning upon the various *Phænomena* of Nature. This reminds me of what Doctor *Baynard* ſays, in Sir *John Floyer*'s *Hiſtory of Cold-Baths*, viz. — That "Learning in "ſome Men only ſerves to worſen them." Such Men (as I have been ſpeaking of) may very juſtly and aptly be compared to an induſtrious Husbandman, or expert Gardener: For, as the former beſtows the beſt Manure on the barreneſt Soils, and the latter lends preternatural Aids to raiſe the colder Seeds and Plants; ſo thoſe Gentlemen take more than ordinary Care to dung their cold, infertil Brains with a great deal of Learning. I remember a Paſſage in an epigramatical Poem (wrote by a young Phyſician, and one of the fineſt Genius's of the Age) which ſuppoſes to a Tittle what I here aſſert. It is this — "Great Phyſicians "we have heard of, meer Quacks in Diſpu-"ting, *&c.*" It muſt be confeſſed, however, that (generally ſpeaking at leaſt) an accurate Acquaintance with the dead Languages and Logick, with the School Philoſophy and Mathematicks, muſt cultivate and improve every Genius: And every one who is an Adept in theſe Things, will (*cæteris paribus*) excel another who is leſs verſed in them. But, if the Genius ſo equiped had not, in its rude and natural State, a peculiar Turn and Aptitude to ſolve and diſcuſs whatſoever *Phænomena* may preſent in a mechanical Light; the Man (indeed) may make a Figure in the World, but will never have much real Merit in his Profeſſion: For it may be ſaid (in a comparative Senſe) of a Phyſician, as of a Poet, *Naſcitur non fit*: That is, in a Degree of Eminence or Perfection. But to my Purpoſe.

We ſee ſeveral Diſeaſes, diametrically oppoſite in their Natures and Symptoms, cured by the ſame ſpecifick *Spaw* Water. One

Man has an utter Dejection of Appetite; another a violent, but depraved one. In one the Fibres of the Stomach are too lax; in another too tenſe. In this Man the Ferment of the Stomach is exorbitant; in that weak and languid. One Perſon's Bowels ſhall be of a hot Temperament; another's of a cold one. The *Bile* ſhall be redundant in one; and deficient in another. The Guts of one Perſon, ſhall be too rigid and conſtipated; thoſe of another too lax and open. Some perſpire too little; others (though but few ſuch) too much. We obſerve the Blood to be too hot and rapid in ſome; too cold and lazy in others. We ſee Tumours and Defluxions of different Natures, and proceeding from different Cauſes; as ſome from Heat, and too violent a Motion; others from Cold and too ſlow a Motion of Humours. We ſee ſome Women labouring under violent menſtruous Fluxes; and others under ſevere Obſtructions; and all theſe, in common, cured by the ſame ſpecifick *Spaw* Water. *Finally*, We ſee ſome Women rendered fertil by the Uſe of theſe Waters, who had been barren for many Years, againſt the Force of all other Medicines: But here, indeed, they do not produce the contrary Effect; for no Woman was ever rendered ſteril by them.

Now; To obviate and ſolve the Nature and Reaſon of ſo many extraordinary and different Operations or Effects: I ſuppoſe firſt, That all theſe Diſeaſes which have their particular Shapes and Appearances, and ſeem to have different and diſtinct Eſſences, do primarily ariſe from Errors, either in our Accretions, or our Secretions. Theſe are (in my Opinion at leaſt) the *Cauſæ primæ*, or original Cauſes of moſt Diſeaſes; ſubordinate to, and dependent on theſe, are other Cauſes, which are properly ſtiled the mediate Cauſes. Theſe are Humours that offend either in Quantity or Quality; or perhaps in both. Such Humours as offend in the firſt Senſe, cauſe a Plethora, or Redundancy. This generally yields to Faſting, or proper Evacuations: But if it ſubſiſts long, may produce very many and great Diſorders; as Headaches, Giddineſs, Vertigoes, Apoplexies, Shortneſs of Breathing, Oppreſſion at the Stomach, Loſs of Appetite, Bloody Fluxes, and Hemorrhages of the various Kinds, Tumours, Defluxions, &c.

The Reaſons why, or how all theſe Diſorders may ariſe from a Plethora or Redundancy, are too obvious to any Phyſician (I would hope) to need explaining.

The Diſeaſes, which will neceſſarily reſult from Humours offending in Quality, are very numerous; and (I apprehend) may reaſonably be ſuppoſed to conſtitute nine Tenths of all the Diſeaſes which infeſt Humankind. They are even capable of producing all the Diſeaſes above mentioned, (and aſcribed to an Offence in Quantity,) though by different Ways and Means. Hence ariſe all Sorts of Fevers, except the contagious and peſtilential. Theſe (*viz.* Humours offending in Quality) are the Parents of almoſt all chronical Diſeaſes; ſuch as the Hypocondriac, Scorbutick, Scrophulous, Strumous, Leprous, Nephritick, and Gouty: As alſo, the Rheumatiſm, Jaundice, Dropſy, and even Madneſs itſelf. Indeed, ſome of theſe may poſſibly be produced from Errors in Quantity; but that will very rarely happen. Now, That I may not appear to the Undiſcerning and Incredulous, to impoſe a meer *Ipſe dixit* upon the World, I ſhall proceed to explain this long Train of Diſorders (which appear ſo oppoſite to one another in Nature and Eſſence) upon the aforeſaid Hypotheſis; and demonſtrate that they ſpring from one and the ſame mediate Cauſe, only differently diſpoſed; That is, from Humours offending in Quality. And, Firſt, a Loſs of Appetite may proceed (as indeed it generally ſpeaking does) from ill Humours depoſited in the Stomach, or otherwiſe critically thrown upon it from the Blood; which will neceſſarily weaken or vitiate its Ferment. On the other Hand, groſs, ſlimy, or viſcous Humours, clogging and obſtructing the Glands and Capillaries of the Stomach, may deny Acceſs to the animal Spirits, and thoſe Juices, by whoſe Joint-Force and Irritation the Perception of Hunger is excited. Or furthermore, ſlimy, ſizey Humours, gathering within the Cavity of the Stomach, and ſticking to its inward Rugee, or Plies, may either weaken their Force, or render them ſo ſlippery, as to ſubvert their Faculty of retaining the Aliment received into the Stomach, 'till the Office of Digeſtion is duly performed. A ravenous, depraved Appetite, or *Fames canina*, muſt be cauſed by acrid, corroſive Humours, whoſe preciſe Figure I will not pretend to determine; or by a vitiated and too-exalted Ferment, which may immediately proceed from them. A Relaxation of the Stomach's Glands and Fibres, may come from their Immerſion, or ſoaking in ſlimy, viſcous Humours; or from the ſame Humours obſtructing, and immoderately diſtending the capillary Veſſels; by which Means the Nerves may be ſo compreſſed, as to deny a due Acceſs to the influent Spirits. On the contrary: Too great a Tenſion of the Stomach's Fibres, *&c.* muſt reſult from an impetuous Influx of animal Spirits; or from hot, acrid Humours, which too violently irritate and contract them. An Exceſs or Defect of the Stomach's Ferment, fall under the immediately preceding Definitions; or otherwiſe may ſpring from an ill proportioned Mixture of its natural Juices, *&c.* A hot Temperament of the Bowels muſt neceſſarily flow from too rapid an Influx of Blood and Spirits; or from a Redundancy of irritating Humours; or poſſibly (indeed) from a Defect of Mucoſity. A cold Temperament (on the other Hand) from a Defect of animal Spirits, and a Surcharge of phlegmatick, ſlimy Humours. A too rigid and conſtipated, or too lax and open State of the Guts, generally ariſe from the oppoſite Temperaments juſt mentioned; and conſequently, are only remoter Effects of their Cauſes. A Defect of Perſpiration moſt commonly proceeds from an Obſtruction of the excretory Pores; but it may poſſibly reſult from ſome exceſſive and oppoſite Evacuation; as by Urine, Stool, or Spitting. On the contrary: An Exceſs of Perſpiration muſt proceed from a Suppreſſion of ſome one or more of thoſe; or elſe from violent Exerciſe, or too great a Relaxation of the excretory Pores: Though, indeed, the Conſequence of the latter would rather ſhew itſelf in groſs Sweats, than what we (in a ſtrict Senſe) underſtand by Perſpiration.

Here I can't omit to relate one Inſtance of what I have juſt now advanced. The Story was told me at *Spaw* (even whilſt I was writing this) by my worthy Friend Doctor *Cocquillet*, Sen. He relates, That he had a Gentleman for his Patient, who had not the leaſt Diſcharge by Urine for the Space of a Year and half; but that the Sweat fell from him in large Drops; which the Doctor ſuppoſed,

poſed might Counterballance the Surcharge of Fluids, which muſt neceſſarily reſult from a total Suppreſſion of Urine. But, ſuppoſe we that; moſt certainly it could not be ſo heathful, becauſe 'twas not ſo natural. This Gentleman went to *Spaw* on Purpoſe to ſeek a Cure from the Waters, (commiting himſelf to the Care and Directions of the ſaid Doctor *Cocquillet*;) which he very happily and ſoon obtained. The Doctor obſerved further, that the Patient drank very hard of ſpirituous Liquors, even whilſt he had this Diſtemper upon him. Doctor *Cocquillet* ſaid, He found but few Believers amongſt the many Perſons, and even Phyſicians whom he told it to. The Caſe was (indeed) very uncommon: But I am nevertheleſs ſurprized, that Phyſicians (eſpecially) ſhould account it ſo great a Prodigy.

A too rapid Motion of the Blood, may reſult from external Heat, and violent Exerciſe; but doubtleſs does more commonly proceed from hot, irritating Humours intimately mixed and incorporated with the Maſs; which, by their Stimulus excite the Blood to violent Motion, increaſe the Niſus of the artereal Veſſels, and precipitate the Separation of animal Spirits. On the contrary; a too ſlow, lazy Motion of the Blood, muſt derive from cold, ſizey, viſcid Humours; which flowing with the Blood, will ſheath and depreſs its native Heat, weaken the Elaſticity of the arterial Veſſels, and obſtruct the due Secretion of animal Spirits. Tumours of the various Sorts (whether by Fluxion or Congeſtion formed) are produced from Humours ſome Way or other offending in Quality. As for Example: A Tumour by Fluxion, comes from hot, irritating Particles; determined, or critically thrown off from the Blood upon ſome one Part or other; where, their Paſſage being hindered by Reaſon of their Figure or Size, they ſtagnate, and a Tumour immediately enſues; or, otherwiſe, the like might be produced by ſharp Humours determined on a Part; whoſe Spiculæ or Points, ſtriking into, and wounding the Sides of the Veſſels; the ſuppoſed Veſſels would thereupon contract themſelves violently; drive the pointed Wedges yet deeper into their Sides; and the conſequent Hurry and Confuſion of Humours would neceſſarily bring on a Tumour. Tumours by Congeſtion (on the other Hand) are cauſed by the Groſſneſs, Sizyneſs, and Viſcidity of Humours; which ſettling gradually, in this or that Part, form a Tumour by ſlow Degrees, and frequently without Pain. Defluctions, indeed, generally proceed from Redundancy, and ſometimes from the Weakneſs of Parts.

Inordinate menſtruous Fluxes, moſt commonly take Riſe from Redundancy; but ſometimes from too great a Heat and Rapidity of the Blood: Or, otherwiſe, from ſharp, corroſive Humours; which falling upon thoſe Parts, tear the Glands and capillary Veſſels. Suppreſſions of the Menſes, are moſt commonly cauſed by groſs, viſcous, tenacious Humours; which, choking up the Glands and capillary Veſſels of the Parts, deny Paſſage to the Fluid deſtined to be diſcharged by that Way. Indeed, the like Effect may (and doubtleſs ſometimes does) proceed from immoderate and oppoſite Evacuations: Or, from hot, irritating Humours; which, being thrown off upon thoſe Parts, contract and ſhut up the Vents.

I flatter myſelf, it will by this Time evidently appear that the *Pouhon* Water, if it really has the Virtues and Qualities I have aſcribed to it, (which I, myſelf, am perfectly well convinced and aſſured of, as well from Reaſon as Experience,) may be capable of giving Relief in all the Diſorders above mentioned. However, I will attempt to give a general, though a ſhort Reaſon to confirm it. And firſt: This Water, by its forcible Action on the Stomach, greatly increaſes its Attrition; and by ſtrengthening the contractil Force of all its Glands, enables them duly to eject their Contents, and then ſcowers them off; which, otherwiſe, by reſiding long in them, might choke up, and diſtend them: The Glands of the Stomach, being thus choked, and preternaturally diſtended, would deny Acceſs to the animal Spirits and influent Juices; and conſequently, either pervert or impair the Functions of the Stomach. This Water provokes Appetite, and confirms a good Digeſtion and Concoction. Thus the *primæ Viæ* are ſecured, and all their Functions eſtabliſhed. And hence, all our Aliments paſs into the Blood (through thoſe common Recipients, the *Lacteals*) perfectly elaborated, and free from Crudity, Acidity, Viſcidity, or other Depravities. Hence again, the Water gets a ſwift Tranſition into the Blood-Veſſels and mixes with the Fluid; where, at the ſame Time that it augments its Velocity, it prepares and fits its Humours for Motion; by correcting the acid or acrid, and by attenuating the viſcous or glutinous. And, laſtly, by increaſing the Action both of the Solids and Fluids, it forces the Obſtructions of the Skin, (if any there be,) and reſtores and confirms a due State of Perſpiration. Moreover, all theſe great Ends are effectuated at one and the ſame Time, without the leaſt Violence or Offence to the Conſtitution; which will neceſſarily and equally tend to repair all Weakneſſes, repreſs Fluxes, and other irregular and exceſſive Evacuations, as to open Obſtructions. It opens Obſtructions, by promoting the Attenuation, and increaſing the Motion of the Fluids: As on the contrary, it redreſſes Fluxes, and other inordinate Evacuations, by aſſiſting and increaſing the oppoſite Diſcharges, by which Means the Tendency and Preſſure of the Humours upon that Region are diverted; and by deterging and cleanſing the Veſſels of the Parts affected, and by reſtringing their lax Solids. This Water is a Specific in Barrenneſs, from what Cauſe ſoever it may proceed, except it has a Foundation in Nature; and even then, (which may ſeem a Paradox,) may poſſibly ſupplant it. But this is ſo eſſential a Part of their Utility, that I cannot omit to make ſome Reflections upon it.

The Cauſes of this unhappy Circumſtance are various. In the firſt Place, Barrenneſs may proceed from a Weakneſs of the Parts in general, or a Relaxation of the Womb in particular; which, in Conſequence of either, will be incapable duly to perform its Office: That is, of retaining the Treaſure committed to it. The Whites, if in a great Degree, are abſolute Bars to Fecundity; and they may produce that fatal Effect two Ways. *Firſt*, By deriving and exhauſting a great Deal of that Subſtance, which is required for the Nouriſhment of the Fœtus. Or, *Secondly*, Should a Woman conceive under this Diſorder; the diſeaſed Matter, for want of a free Outlet, diſcharging itſelf into the Womb, might deſtroy or prevent the firſt Rudiments of Generation, by mixing with, diluting and ſpoiling the Stamina, as well as the Pabulum or Nouriſhment appointed for it.

Thirdly, A total Defect of the Menſes are Bars to Pregnancy.

Now, Let us ſuppoſe Barrenneſs an Effect of the Cauſe firſt aſſigned, *viz.* That it proceeds from a Weakneſs of thoſe Parts in general, or a Relaxation of the Womb in particular. The *Pouhon* Water is, in that Caſe, perhaps, preferable to any other known Remedy; and being duly and adviſably uſed, will very probably obtain the deſired End, by ſtrengthning the weak Parts in general, and by invigorating, inſpiriting, and reſtoring the relaxed Womb, in particular. If Sterility reſult from the Whites, this Water claims the Precedency of any other Medicine whatſoever; for it moſt powerfully penetrates and ſearches, deterges and cleanſes the lymphatick Glands from all their Filth, Slime, and Mucus; and at the very ſame Time, ſtrengthens and reſtores their contractil Force. But, whereas the Whites do ſometimes ariſe from a Defect of Perſpiration, or ſome other natural Evacuation; this Water will moſt eminently and effectually relieve in that Caſe, for Reaſons already aſſigned.

But, moreover, the Male Sex are ſometimes ſubject to Infirmities, which are comparatively the ſame with thoſe I have been mentioning in Women: For, we have heard ſpeak of Imbecility and Impotency in Men, as well as Sterility in Women; in which Caſes, theſe Waters prudently and duly adminiſtered, muſt afford great Help. To make this Aſſertion appear feazible, I will, firſt, ſet forth from what Cauſes Imbecility in Men can reaſonably proceed. Theſe indeed are various: And, *Firſt*, (to paſs over the common, trite Cauſe aſſigned by ignorant Perſons and Empericks, called *Onaniſm*, or Self-Pollution,) 'Tis poſſible that a Man's Blood may not be ſufficiently replete with the neceſſary Stamina. In ſuch a Caſe the ſecreted Semen will be very little in Quantity, or very poor and ſpiritleſs in its Nature and Quality. *Secondly*, Suppoſing the Blood to be duly furniſhed in this Particular; the *Vaſa afferentia* may be naturally too narrow; or may be accidentally contracted or obſtructed, ſo as to deny Paſſage to a ſufficient Quantity of Blood. Or, *Thirdly*, The preparatory Organs may be ſo choked and obſtructed with viſcous, ſizey Humours, as to hinder their natural Functions. *Fourthly*, The *Proſtatæ* may be ſo immoderately diſtended and weakened, that the Semen depoſited in them may run off upon the leaſt Exerciſe or Strain; ſo that there will be but little or none left in thoſe Repoſitories to anſwer the proper Occaſions.

I don't remember, indeed, to have been informed, either by Reading or Converſation, that theſe Waters have been adminiſtered, or even recommended upon theſe Occaſions: But nevertheleſs they muſt certainly be of very great Account in them. For if we recur to what has been already ſaid of the Virtues and Properties of theſe Waters, *viz.* That they inſpirit, invigorate, and ſtrengthen the Blood; ſo, *Firſt*, They muſt, in Proportion, heighten and increaſe all its more noble Principles. *Secondly*, They muſt give a vigorous Action to the Fluids, and a ſtrong Flexure to the Solids. *Thirdly*, They muſt tend to delate the over-contracted Veſſels, and reſtore a free Circulation of the Juices. And, *Fourthly*, That they promote the Attenuation and Reſolution of all viſcous, ſizey, tenacious Humours, and reſtore the weakened Glands and Veſſels, has already been ſufficiently proved.

Thus I have given a general, but conciſe View of the Virtues and Qualities of the *Poubon* Water; mechanically deduced from the Principles, with which (upon Analyzation) it appears to be impregnated.

I ſhall now abſtract my Reflections upon it; and direct it to ſuch Diſeaſes, as it ſeems particularly calculated to, and ſpecifically good for. And theſe are, principally, all Obſtructions of the lower Belly, *viz.* of the Liver, Spleen, Miſſentary, *&c.* inveterate Quartans, Tumours and Hardneſs of the Hypocondrias, Hypocondriac Melancholly, King's-Evil, and the Dropſy, if recent, and the Solids not corrupted. It reproves all billious Diſorders, by regulating their Sourſe, that is, the *Bile*; which it either raiſes to, or confines within its proper Limits. It reſtrains and regulates inordinate menſtruous Fluxes; and with equal Force and Certainty, removes their Obſtructions. It breaks to Pieces, and expels all Concretions in the Reins, Ureters, or Bladder, whether they be Stone or Gravel: And, finally, it cures the Scurvy, by ſupplanting its firſt Cauſe. But, be it underſtood; I am not ſo bold as to ſuppoſe it cures Stones, or Calculi of all Magnitudes and different Textures: For we have ſeen ſome, which have been taken out of dead Bodies, and others extracted from living ones, that are near as hard and compact as Flint; and which no Medicine in Nature could ſo much as touch, or produce the leaſt Effect on; let whimſical Chymiſts, and other chimerical Perſons talk what they will. But for Stones of lighter Subſtances, and looſer Textures, they are certainly diſſolvable in the Body; and to that End, this Water will work Wonders.

Thus far: Having deſcribed the Virtues and Uſes of the *Pouhon* Water; I come now to ſay ſomething in Abatement of it: Which, however, I cannot offer upon the Foot of Experience, but Tradition, and the common Teſtimony of the People, as well as the Opinion and Report of Phyſicians who reſide at and about *Spaw*. I have been credibly informed, and well aſſured, that this Water has been found hurtful ſometimes in the Gout; as alſo in ſtubborn aſthmatick Diſorders, and radicated Coughs. The Reaſon of which may be this: When the Matter conſtituting a Fit of the Gout, is ſo compact and ſolid, as to refuſe Diſſolution, Diviſion, or Comminution; or when that productive of an Aſthma, a Cough, or the like, is ſo tough and viſcous, as not to admit of Attenuation or Reſolution; either Caſe will be ſo far from meeting with a Cure, that, on the contrary, it will be the more confirmed by the Uſe of this Water. But then, even in theſe Caſes, I conceive that ſome previous, preparatory Methods might be directed by the ſkilful Phyſician, which would greatly facilitate and contribute to the Succeſs of the Water: And ſuch, as in moral Certainty would prevent any ill Effects from it; though the Ends propoſed were not perfectly obtained. But, indeed, it is too much the Practice of Perſons who viſit *Spaw*, to go giddy to work, and drink the Waters without conſulting a Phyſician concerning the particular Kind; the neceſſary Preparations, and the Quantity or Manner of Drinking. And though many may do this, without drawing any palpable Inconveniency on themſelves; yet they very probably fruſtrate thereby the Benefits and Advantages which might otherwiſe have been obtained. And thus, theſe Waters, the moſt innocent, as well as moſt excellent Remedy in the World, may be ſometimes brought into Diſcredit.

When I reflect on the many excellent Virtues and Properties of this Water, and its admirable Effects, I apprehend a very juſt Parallel may be drawn betwixt them, and thoſe which ariſe from Cold-Bathing; ſo far as the latter extend: For the Uſes and Benefits of Cold-Bathing are, by much, more limited and confined than thoſe of the *Spaw* Water. Cold-Baths are calculated and adapted rather to prevent, than cure ill Habits in general: Whereas the *Pouhon* Water does both the one and the other. The Uſe of Cold-Bathing would be very pernicious, and even deſtructive in many Diſeaſes ariſing from ill Habits of Body; but the like could not poſſibly happen from *Spaw* Water in equal Circumſtances. However, Thus far their Uſes and Benefits may be drawn in exact Parallel: The *Spaw* Water ſtrengthens and reſtores the impaired Action of the Fluids and Re-action of the Solids; ſo does Cold-Bathing; but inverſly. The *Spaw* Water dephlegmates, thins, and refines the Blood in a duplicate Senſe: The Uſe of

Cold-Baths, does the ſame in a ſingle Senſe. *Spaw* Water ſtrengthens the nervous Syſtem, and promotes the Elaboration and Separation of animal Spirits: Cold-Bathing does the ſame. The *Spaw* Water is eminently good to correct Errors in our Secretions, eſpecially that of Perſpiration; ſo is Cold-Bathing. *Spaw* Water ſtrengthens and reſtores the decayed elaſtick, or contractil Force of the excretory Pores, hardens the Skin, and renders it Proof againſt Cold, and the like external Injuries: And, that the Uſe of Cold-Bathing, anſwers all theſe Ends in the higheſt Degree of Perfection, is univerſally allowed. On the other Hand; wherever the *Spaw* Water has appeared to be hurtful; as in ſtubborn Gouts, Aſthmas, radicated Coughs, and the like; there too, Cold-Bathing would be extreamly pernicious. And the Reaſon of theſe Things will appear plain, if we conſider, *Firſt*, That Cold-Bathing has only the ſingle Property or Power of hardening a lax Skin, and of increaſing the contractil Force and Action of the Solids, and Reaction of the Fluids: But it communicates no other Benefit to the latter, except ſuch as will neceſſarily reſult from the ſuppoſed increaſed

Action of them: And theſe are the Reſolution and Comminution of all grumous, phlegmatick, and ſlimy Humours; by which Means, thoſe already formed, and incumbent in the Blood, will be prepared and thrown off by the Excretories of the Body, and the Generation of new ones be at the ſame Time prevented: Whereas, the *Pouhon* Water does not only anſwer all thoſe Ends, by the very ſame Mechaniſm inverſly; but at the ſame Time, by its volatil, elaſtic Spirit, and other inherent Qualities, greatly aſſiſts to the Accompliſhment of the ſame, and many other great Ends.

Furthermore, The *Pouhon* Water and Cold-Bathing are alike qualified to render the Body defenceable (in a comparative Senſe at leaſt) againſt all malignant and peſtilential Diſeaſes. For, As both the one and the other manifeſtly ſtrengthen the elaſtic, contractil Force of the exterior Pores, increaſe the Motion of the Blood, and cauſe a ſtrong and vigorous Perſpiration; ſo they muſt neceſſarily ſtrengthen the Barrier without. For, in Proportion to the Quantity of Matter thrown off by Perſpiration, and the Force with which it is propelled, it will reſiſt and repel all malignant and other noxious Effluviums.

That great Numbers of weak, valetudinary Perſons, have been rendered ſtrong and robuſt, by the Uſe of *Spaw* Water or Cold Bathing, is undeniable: And I apprehend it would be no difficult Matter to adjuſt the Quantity or Meaſure of ſuch Effects by certain Experiments. As for Example, By holding finely poliſhed and burniſhed Mettals, or Looking-Glaſſes before a Man's naked Stomach and Breaſt: For, By ſuch Experiments, the Quantity of Dew they received, and the Diſtance they took it at, would ſufficiently determine the Degree of Perſpiration, and the Extent of its Atmoſphere. The Effects of this Sort, produced from the Uſe of *Spaw* Water and Cold Bathing, reſemble thoſe cauſed by voracious feeding on high ſeaſoned Meats and ardent Spirits; only thoſe flowing from the latter, are momentary, ſoon ſubſide, and give Place to bad Conſequences; whereas, thoſe produced by the former, are conſtant, equal, and permanent, and are aſſociated with many other great Benefits.

To make this appear, Let any one, by Means of the above-mentioned Experiments, meaſure the Extent and other Circumſtances of the Atmoſphere, encircling a Perſon under a Debauch of high ſeaſoned Meats, and ardent Spirits: And let him obſerve again, by the ſame Experiments, when the Debauch is intirely over; he will aſſuredly find the Action of the atmoſpherical Effluviums to be much brisker, the Subſtance denſer, and the Extent greater in the firſt State, than in the latter. Now, under the Circumſtance of ſuch a Debauch, a Man would, perhaps, be as well ſecured againſt the Acceſs of infectious Diſeaſes, as if he was intereſted with all the Benefits of *Spaw* Water, or Cold-Bathing. But, alas! When this temporary Guard is fled, leaving a weak Barrier without, and the Fortreſs within equally defenceleſs, he will then become a very eaſy Victim to the Fury of the Enemy.

The learned and ingenious Doctor *Cheyne*, (I remember,) in his *Eſſay on Health and long Life*, cenſures Punch very ſeverely, for the many Miſchiefs it cauſes to Perſons much accuſtomed to drink of it; and eſpecially the *Weſt-Indians*. But, for my Part, (though I have all imaginable Reſpect and Deference for Doctor *Cheney*'s Sentiments and Writings,) I am of Opinion, that the Miſchiefs he charges it with, proceed rather from the Diſorders it creates in our natural and regular Secretions, than from any noxious Qualities inherent in the Punch itſelf. And, the Diſorders I would be underſtood to mean here, may be no other than an Inequality in our Secretions at different Times. For, Suppoſe a Man to debauch every, or every other Day with Punch, or any other ardent, ſpirituous Liquor: In that Caſe, all the Secretions, but eſpecially Perſpiration, would be in a State of reciprocal Ebbing and Flowing, which would be ſufficient to ſuperinduce very many and great Evils.

The *Geronſter* Water, which is at this Day in great Repute upon the Spot, is, as it were, ſaturated with a ſulphureous Vapour or Eſſence; which, as I have already proved, is exceeding volatil. It is this ſulphureous Impregnation, which (by Reaſon of its great Abundance and Volatility) renders it ſo eminently uſeful in all aſthmatick Diſorders, and inveterate Coughs. Its Mars, as I have ſaid before, is better elaborated, and more genuine than in any of the other Waters, as appears by its ready Approach to the Magnet; which it does without that Purgation by Fire, that is requiſite to ſeparate it in the Feces of the other Waters. This Water is of wonderful Efficacy in curing Barreneſs; that, indeed, is accounted its cardinal Virtue: It acts here, chiefly, by Means of its ſulphureous Eſſence; which not only attenuates and diſſolves the viſcous, ſtagnant Humours, and ſo ſcoures and cleanſes the Glands and Veſſels of the Womb, from whatſoever foul Humours they may be ſtuffed with; but at the ſame Time, invigorates and inſpirits the whole Seat of Generation. It is a grand Specific in the Scurvy; which it cures ſooner, and by a different Mechaniſm to that of the *Pouhon*: It warms, comforts, and ſtrengthens a cold, weak Stomach: It powerfully corrects all Acidities and Auſterities, and diſcharges their Matter either by Urine, Vomit or Stool: It deſtroys all tenacious, viſcous Humours in the Blood, and renders it fluxil, pure, and ſpirituous. Its Virtues extend even to the Gout (that Scandal to Phyſick and its Miniſters;) which it generally relieves, and ſometimes cures.

I cannot omit to remark, That this Water is attended with very odd Effects when People firſt begin drinking of it. It gives a Giddineſs, and to ſome a Numbneſs of the Head; which greatly indiſpoſes Perſons for Reading, but more eſpecially for Writing, during ſome Hours. Theſe Effects plainly ſpeak the volatil, ſulphureous Eſſence; which, by rarefying the Blood, ſo diſtends the arterial Veſſels, that the Nerves are compreſſed by them, and the animal Spirits ſeem impriſoned for a Time: Or, the like *Phænomenon* might ariſe from an extraordinary Action impreſſed on the animal Spirits themſelves; whence the Brain might be for a Time confuſed; and the Nerves and Membranes endeavouring at Extenſion, ſeem girt and confined. The *Sauveniere*, is what next demands to be ſpoke to.

The Virtues and Properties of this Water are not very numerous; but are, nevertheleſs, extraordinary in their Kind. This Water is chiefly directed and determined to the urinary Paſſages, being highly Nephritic and Diuretic; and, conſequently, powerfully breaks to Pieces, and expels the Gravel and Stone; whether it be in the Kidnyes, Ureters, or Bladder. It is a ſovereign Remedy for Ulcers in the Reins, Ureters, or Bladder; which, it firſt deterges and cleanſes, and afterwards diſpoſes to heal. It is likewiſe a Specifick in the Hemorrhoides, and repreſſes inordinate Fluxes of the Menſes.

The three other Fountains, *viz.* The *Groesbeeck*, the *Wartroz*, and the *Tonnelet*, have likewiſe their reſpective Virtues and Properties: But, as I had not Time to examine them by Analyzation; ſo, am not duly qualified to judge, or ſpeak of them.

I might enlarge, and embelliſh this little Treatiſe with numberleſs Cures, wrought by theſe Waters; which I could have gathered from the Phyſicians, and other Inhabitants of the Country; and which would be ſo many Teſtimonies of the Juſtice and Truth of my Reaſonings upon them: But that would be foreign to my Intention and Purpoſe; which were only to give a ſuccinct, mechanical Explanation of the reſpective Natures, Properties and Uſes; and to aſſign Reaſons for the various and great Effects of theſe Waters; and all theſe founded upon, and deduced from the moſt ſolid Baſis, *viz.* The Natures, Virtues, and Properties of the ſeveral individual Principles, with which they appear to be impregnated; and that, conſidering them, firſt in their ſimple, and afterwards in their compounded State.

Poſtſcript. Although, in reviſing and tranſcribing this Eſſay, (after a Suſpenſion of ſeven Years; during which Time, it has been out of my Hands,) I have ſtrayed a little from the Promiſe I made in the Preface, of ſticking cloſe by my Text, and introducing Nothing that was not ſtrictly pertinent to it: Yet, as I have only interſperſed a Digreſſion or too, (which duly conſidered, may appear not altogether foreign and impertinent to the main Scope,) and have, *en paſſant*, paid a ſlight Tribute to the Merit of ſome great Men of the Faculty: So, I hope the candid Reader will be indulgent, and pardon this Breach of my Covenant with him: For ſuch I account the Preface of a Book to be.

OF THE
Hot FOUNTAINS
AT
AIX-LA-CHAPPLLE, &c.

HAVING propoſed in the Title to to the foregoing Piece, to ſubjoin a curſory Enquiry into the Natures and Properties of the hot Fountains at *Aix-la-Chapelle*; and having to that End, taken a View of the ſeveral Springs there, and taſted them on my Way to *Spaw*; yet I deſigned at my Return, to have paſſed a longer Time there, on Purpoſe to have gone through the whole Claſs of Examinations upon their Waters. But, juſt as I had finiſhed the above *Treatiſe on the Waters of* Spaw, and was preparing to return to *Aix*; ſome Affairs of Moment required my immediate Departure for *Holland*. Hereupon I contented myſelf with getting all the Materials I poſſibly could, and brought them with me. What I here call Materials, are the Principles diſcovered and produced from them by Analyzation, &c. And theſe were only a Salt, and a very fine Flower of Brimſtone; which laſt ſeems to me to be Nothing elſe than the meer groſs and ſubſtanſtial Part of a Vapour, which is perpetually ſteaming from the Waters, and gathers to the Sides and Roofs of the Pits and Bathing Rooms; whilſt the more fluid, watry Particles diſſipate. However, Though I have not had an Opportunity of analyzing theſe Waters; yet, as I am well aſſured, by Phyſicians and others, that the Salt and fine Sulphur aforementioned, together with the more groſs Sulphur that is produced by Exhalation, are the only Principles diſcoverable in them: So I hope, upon a due Examination of thoſe Individuals, to be able to judge and determine on the Virtues and Uſes of the Compound. But before I proceed, it may not be amiſs, that I relate the Sentiments of ſome Writers of that Country, concerning the Nature of their Waters.

And, *Firſt*, They all agree to allow they contain a Sulphur in great Plenty; and though they don't expreſs it in the Manner I do; yet, were we to debate it fairly together, I believe they would ſcarce diſagree with me. Their great Diſpute is about the Salt found in them; and concerning this important Point, there are very many and different Opinions.

Monſieur *Heueſh* maintains, that it is an alcalic Salt, inclining to the lixivious Kind. Meſſieurs *Blondel* and *Didiez* affirm it to be a Confuſion of Sea-Salt, Nitre, and Alom. Monſieur *Franciſcus de le Boë Silvius*, as well as Monſieur *Heueſh*, denies that Sal Gem, or Nitre, bear any Proportion in this Salt: And the former urges, as a Proof, that the great Acidity of Sal Gem, or Nitre, cannot admit of ſuch a Suppoſition. *Abheers* agrees with theſe latter, in the Opinion that it contains no Nitre; and he gives for a Reaſon, that Nitre is no where generated, but in the Superficies of the Earth, and not in its Entrails: Becauſe the acid Air (which he takes for granted, is abſolutely neceſſary to the Formation of Nitre) cannot penetrate into the Bowels of the Earth; where he ſuppoſes theſe, and indeed all other mineral Waters, receive their Impregnations. Monſieur *Vicaire*, is likewiſe of Opinion, that Nitre has no Share in this Salt: But he pretends to ſupport his Notion by a dogmatical Poſition, which I can by no Means allow to be juſt: For, he confidently affirms, that Nitre is a Part of, and peculiar to the animal Kingdom; and that it does not in the leaſt appertain to the Mineral, *Glauber* ſeems to refute this Poſition with great Colour of Reaſon. He aſſerts and maintains, that there is no Compoſition in the three Regions of the animal, vegetable, or mineral Kinds, without Nitre: And this ſeems very probable; becauſe the alcalic Salt of Vegetables and Minerals, together with the Acid of the Earth, are, in Nature, no other than the Acid of the Air, and the alcalic Salt of Animals; from which Nitre is generally allowed to be produced.

The ſame Thing may be ſaid of all mineral Waters; becauſe the moſt alcaline amongſt them contain ſomething of an acid Spirit: And *Vicaire* affirms, that ſomething which he calls the univerſal, interior, acid Spirit of the Earth, is the efficient Cauſe of all ſuch Impregnations in Waters. He ſuppoſes this Spirit to exiſt in all Minerals; and that upon their Immerſion in Water, the Spirit extricates itſelf from its Impriſonment: And, that afterwards by its reciprocal Action on the Minerals, and the Water in which they are immerſed, it divides, ſubtilizes, and finally, prepares and diſpoſes the Minerals in ſuch a Manner, as to make them incorporate, and become eſſential with the Water.

Thus I have given a ſhort Abſtract of the Sentiments of ſeveral the moſt reputed Authors, who have moſtly reſided at, and about *Aix-la-Chapelle*, concerning the Nature and Eſſence of their Waters; believing it will not be unacceptable to the Reader. But, I am of Opinion, the World will agree with me, that theſe chymical Definitions are only a Gingle of Words, and prove very little, or nothing eſſential. Indeed, they ſeem to me, rather calculated to perplex and confound the Truth of Things, than to obviate and explain it. Doctor *Breſ-*

mal, indeed, offers ſome fair, and honeſt Experiments upon them; but then they only ſerve to prove what one may almoſt diſcern with the naked Eye. As, *Firſt*, Where he avers, that the hot Fountains of *Aix-la-Chapelle* contain a Sulphur; becauſe, that upon the Projection of powdered Gaul into them, they immediately turn as white as Milk. *Secondly*, Becauſe that Nitre and Sea-Salt being concentered with the ſulphureous Acid of Vitriol, and inſtilled into the ſaid Waters, they appear tinged with a purple Colour; which he ſays could not be produced, except by the Mixture of two Sulphurs. But, to ſum up, or rather to baniſh all further Regard to the many Diſputes concerning the Nature of this Salt; I may venture to affirm it (though really neutral) to be much retaining to the alcalic Kind; as is manifeſted by the very notable Effervеſcence that ariſes upon its Projection into acid Spirits. But, though the alcaline (as aboveſaid) is manifeſtly their predominant Quality; yet ſome Experiments evince, that they are not without an Acid too. But, e're I finiſh my Report of theſe

Authors; I muſt do them the Juſtice to relate ſome Accounts from them, which are not incurious. And, *Firſt*, Doctor *Breſmal* aſſerts, that the Sulphur of the *Aix* Waters is produced by a Mixture, or Operation of the univerſal, acid Spirit, with certain fat, bituminous, and ſubtil Particles: And theſe Principles (he ſays) in Conjunction with the lixivious, alcaline Salt, muſt neceſſarily yield a Remedy to Men, for which they cannot ſufficiently thank the Almighty.

This Notion is not diſingenious; and the univerſal acid Spirit, he talks of, being granted; I can eaſily conceive how the ſuppoſed Spirit, acting upon greaſy, bituminous Particles, may change them into the Form and Eſſence of a Sulphur: And was it convenient in this Place; I could offer ſome Experiments, not unlike it in their Nature, which would be ſo many collateral Teſtimonies of its Probability. But Monſieur *Vicaire* delivers Experiments, which are abſolute Proofs of it. He affirms, that any inflammable Oil: For Example, Oil of Turpentine, Juniper, or Amber, mixed with a volatil acid Spirit, and diſtilled through a Retort; there will remain a perfect Sulphur.

This is his Text. ℞. *Pingue aliquod inflammabile*, v. g. *Oleum Terebinthinæ, Juniperi, aut Succini*, &c. *diſtilla per Retortam, & acquires Sulphur vivum perfectum.* (1.) Monſieur *Breſmal* further obſerves, That the Salt, which remains after Evaporation, being put into a Crucible, and placed in a melting Furnace, will melt preſently: That for the Time it is on the Fire, it gives a Flame reſembling live, burning Sulphur; or like common Salt in a melting Furnace. After this Operation, he ſays, the laſt aſſumes an ironiſh Colour, and becomes fixed: Nevertheleſs, it diſſolves in Water; and the Solution being filtered and evaporated, renders a Salt perfectly white: But that Salt, being again expoſed to the Fire, loſes its Fixidity, and diſſipates entirely. But here I take Leave of thoſe Authors; leave them to themſelves, and proceed to deliver my own Sentiments.

The fine Flower of Brimſtone, which reſults from the Steam of the Waters, in the Manner above mentioned, (and in whoſe Formation,

mation, Nature's ſelf is the Artificer) is a very ſubtil, pure Eſſence: And either in its natural and ſimple, or in a compounded State, does undoubtedly very far exceed that prepared by human Art or Skill. Its very Price gives ſome Colour to this Suppoſition: For the Perſon, from whom I had it, told me it coſt him five Shillings per Ounce: And I am aſſured on all Hands, that there is no Inſtance of its being ſold for leſs than two Piſtoles per Pound in Quantity. This, as above obſerved, is a preſumptive Teſtimony of its Excellency; but its Taſte, its Subtilty, and Purity, are ſelf-evident Proofs of it. Beſides this; the more groſs, terreſtrious Flower of Brimſtone, (which the Waters yield in ſuch great abundance by Exhalation,) deſerves our Notice likewiſe. This, though infinitely ſhort of that I have been ſpeaking of, is yet vaſtly preferable to the ordinary Flower of Brimſtone.

The Salt extracted from theſe Waters (as has been already proved) is of the neutral Kind: That is, it is neither perfectly alkaline, nor perfectly acid. It imparts a very ſtrong Reliſh; and being once communicated to the Palate, is retained a good while. It is very picquant, and ſomewhat acrimonious. I am not informed of the Method to extract this Salt from the Waters, ſeparate from the Sulphur: But I apprehend it may be effected by boiling any Quantity of the Water over a Fire, 'till the ſpirituous, volatil Particles, being diſſipated, (which, like as they do in the *Spaw* Waters, preſerve the ſeveral Principles in a State of intimate Mixture, Diſſolution, and Rarefaction,) the individual Principles, reſuming their more groſs and terrene Forms and Natures, begin to attract, aggregate, and combine together. The Water being brought to this State, may be paſſed through a Paper by Filtration; in which Operation all the Salts will eſcape with the tranſparent Water, whilſt the Sulphur remains behind in the Paper: And the filtered Water, being afterwards evaporated, would leave the Salt at bottom: And as to the Quantity of it, according to Doctor *Breſmal*, every Tun of Water yields a Pound of Salt.

This fine Sulphur and Salt, together with the more groſs Sulphur produced by evaporating the Waters, are, as aboveſaid, the only Principles diſcoverable in them: Whence it appears a great Myſtery how they acquire ſuch a Heat in the Bowels of the Earth, as they are evidently poſſeſſed of when they are ſpewed out of it. Indeed, it is natural and reaſonable to ſuppoſe, that the ſoft ſpongy, yielding Parts of ſulphureous Matter, might ſuſtain an eternal Mixture, Motion and Colliſion with the Particle of any Salt whatever, (eſpecially when they both flow in ſo cool, and pacific an Element as Water,) and never excite Heat; like as the Particles of divers heterogeneous Bodies, which perhaps are all hard in their Natures, and diſſimilar in their Figures, moſt reaſonably and neceſſarily muſt do, when in violent Agitation and Colliſion together: And eſpecially when they flow in ſo pure and thin a Medium as Air; which will ſcarce interrupt their Motions, ſheath their Points, or ſtifle the Heat they may produce. The Fact however is evident; and it has been a long conteſted Point amongſt Writers, what are the Cauſes of it. The ingenious Doctor *Chrouet*, in his Book intitled, *Traité ſur les Eaux* *d'Aix*, &c. recounts the Opinions of two Authors, who have been moſt conſpicuous for their Labours to unriddle this great Myſtery, which when brought to Light, won't avail the World a Halfpenny, and very juſtly expoſes them as unreaſonable and ridiculous: But then, he ſubſtitutes Notions of his own, in the room of thoſe he has dethroned; which I confeſs appear to me (though wrought up with more Art, and with a more mechanical and luxuriant Invention) to be equally chymerical and groundleſs. However, having given my Suffrage in its Favour, as preferable to the others, in Point of Invention and Neatneſs, I will here give an Abſtract of it.

Doctor *Chrouet*, firſt ſuppoſes a ſubterranean Cavern, of any given Dimenſions: Let us call it (for Example) 200 Foot long, 60 Feet wide, and 30 deep. *Secondly*, A Bed of Sulphur, ſituated at one End of the ſuppoſed Cavern, to have taken Fire, and to burn continually, throwing its Flames all along the Cavern. In the third Place, He makes this Cavern, towards the farther End, to ſend out a ſmaller Branch on one Side,

which

which, we are to imagine, terminates in a ſubterranean Current of Water. And, laſtly, that the ſulphureous Flames, being projected through this Branch, with great Force and Rapidity, becauſe of its Narrowneſs, are quenched in the Water; and by that Means, doth heat and impregnate it with its Sulphur.

The Objections brought againſt this Solution by the Phyſicians and Authors of the Country are twofold. *Firſt*; It is affirmed, that Fire cannot ſubſiſt without Air. *Secondly*; That the ſuppoſed Bed of Sulphur would decay, and be entirely exhauſted with Time. But theſe Objections are, in my Opinion, of but very little Weight. The firſt is built upon a falſe Suppoſition; (for Air pervades and poſſeſſes all Parts of the Earth, even to its inmoſt Receſſes;) and the latter carries no great Weight with it, becauſe the Earth may continually vegetate Sulphur to feed the Bed proportionably to what is ſpent in Flames.

But here perhaps it may be expected, I ſhould offer my own Sentiments upon the Matter, which I will do with all poſſible brevity: In order to which, it may firſt be neceſſary to deſcribe the Situation of *Aix*.

The City of *Aix* lies in a Bottom amidſt a Circle of Hills, which are pretty high, very rocky, and of an almoſt perpendicular Aſcent. Now, as it's utterly impoſſible to come at an abſolute Certainty about theſe Things, we muſt content ourſelves with the moſt probable Conjectures; and my Conceptions about the Matter are as follows. I imagine ſeveral large Baſons or Reſervoirs in the Bowels of the Hills, which encircle the City, towards their Tops; formed by Nature to receive the Waters continually riſing from all around towards their Eminences. I imagine further, that, the Waters riſing continually upwards, and forcing themſelves inceſſantly into the ſuppoſed Baſons or Reſervoirs, Nature has opened other Conduits or Channels, by which they are derived, and conveyed from the Baſons to the Places where they riſe out of the Earth in hot-boiling Springs.

It will not be diſputed, I believe, that the Cauſes productive of Heat, in all Bodies whatever, are Matter and Motion: And the Degrees of Heat will always be in the compounded Ratios of the Qualities of Matter, and the Quantities and various Directions of its Motion.

I ſuppoſe the Waters to have acquired the firſt conſtituent Cauſe, aſſigned to Heat, before they reached the ſaid Baſons; by running through ſome ſulphureous and ſaline Beds in their Courſe thither: But I preſume that the latter Cauſe was impreſſed on them, in their Paſſage from the Baſons to the Places where they are diſcharged out of the Earth. I ſuppoſe again, thoſe Ducts or Channels, by which the Waters are conveyed from the ſuppoſed Baſons to the Places where they iſſue out of the Earth, have infinite Turnings and Windings; and that they grow gradually leſs and leſs. Allowing Things to be thus diſpoſed, and the Waters to be forced forwards with a great and continual Preſſure, together with their own Weight; and, beſides, paſſing *de vaſibus majoribus in minora*, from larger Ducts or Conduits into ſmaller, they muſt neceſſarily move with great Rapidity: And, as they will meet with many retrograde Courſes in their Way, the Principles or Particles, with which they are imbued, will have ſo great and various Commotions, and be in ſuch different Angles and Directions, as cannot fail to excite great Heat. And further; beſides the Benefit of Heat thence ariſing, this violent Preſſure of the Waters, and inteſtine Motion of the heterogeneous, diſſimilar Particles contained in them, muſt neceſſarily digeſt, divide, ſubtilize and ſublime them to the higheſt Degree of Perfection.

I apprehend this Notion cannot be liable to any Objection, either in Nature or Reaſon; as all thoſe I allude to (of which I have only quoted the moſt ſpecious and ingenuous) are: For, if we conſider the many Rivulets of common Water, which ſpring from the Tops of high Mountains, it would be impoſſible otherwiſe to account for the Way or Manner of their getting thither, than by ſuppoſing that Water does actually pervade the Soil, and aſcends *à Profundis in Altum*: Though I ſhall not go about to explain in this Place, by what Mechaniſm Nature produces a *Phænomenon* ſo contrary to the known Property of Fluids; which is always to deſcend, except ſuſtained by ſomething, or elſe impelled upwards by ſome active Force.

And thus I conceive the *Aix* Waters; the moſt admirable and ſtupendious for their Virtues and Uſes, acquire their Heat and the Perfection of their Qualities. But e're I diſmiſs this Topic; to give my Conjecture all the Force and Weight it's capable of; let us examine it more minutely. I ſuppoſe thoſe Ducts or Channels, by which the Waters are conveyed from the Baſons to the Light, are not only conical, but have infinite Turnings and Windings, in the moſt retrograde and oppoſite Directions to one another; otherwiſe they could not impreſs ſo great a Heat on the Fluid paſſing through them: For though true it is, that conical Tubes or Canals, running in right Lines, might, by the Reſiſtance their Sides would give to the influent Waters, cauſe ſome inteſtine Motion in their inherent Particles; yet ſuch a Motion would be far inferior to that cauſed by the different Turnings and Windings I ſuppoſe.

This Argument has a very natural and juſt Appeal to a Thing every Day viſible to our outward Senſes: Which, though not exactly parallel to it; yet I think gives great Colour of Truth to my Conjecture. This is Thunder and Lightning: I conſider them as one, becauſe they are moſt commonly inſeperable, and are Effects of the ſame Cauſe; both which, I preſume, are cauſed by a violent Compreſſion of Air, abounding with heterogeneous Particles, in the midſt of Clouds, which environ it on all Sides. Now, was that Preſſure, I ſpeak of, equal on all Sides, (a Thing not to be ſuppoſed) the inteſtine Motion cauſed in the Air would be nothing, or, at moſt, but very inconſiderable; and conſequently, but little Heat, much leſs Fire, would be produced. But this Preſſure being unequal on the different Parts of its Superficies; the incloſed Air muſt ſuffer great inteſtine Motion: And thus moving, in Obedience to the unequal Preſſure on its Superficies; tranſverſely and obliquely in all manner of Angles and Directions; its heterogeneous Particles, ſtriking variouſly and forcibly againſt each other, excite ſo great a Heat, as to terminate in Fire. And ſo the Air, which had been for ſome Time pent up and confined in the Midſt of Clouds, enlarges and relieves itſelf by Exploſion, which ſo ſenſibly appears to us in the Shapes of Thunder and Lightning.

I am ſo unhappy, indeed, as to differ from a great Man of our own Country, in Opinion about the Cauſe of Heat in Mineral Waters; that accurate and ingenious Naturaliſt, Doctor *Lyſter*. He ſays, all hot Springs derive their Heat from the ſulphureous Marchaſites, which are formed, heated, and inflamed in the Bowels of the Earth: And from them likewiſe, ſays he, all Earthquakes, Volcanos, and burning Mountains proceed.

I have weighed and conſidered this Notion very maturely and impartially; and ſo far as it regards Volcanos, burning Mountains, and the like, I agree with him: But, as it relates to hot Springs, I cannot help differing from him. For how unreaſonable muſt it be, to imagine that thoſe ſulphureous Marchaſites ſhould continue burning for ſo many Ages, and always with equal Force, or nearly ſo. And furthermore; ſhould the Fewel be exhauſted, or the Fire be extinguiſhed by Time or Accident; the Water would ſoon looſe its Heat. Beſides this, another Objection preſents againſt Doctor *Lyſter*'s Definition. For, did thoſe Waters derive their Heat from the ſuppoſed Marchaſites; they muſt not lie at any great Diſtance from the very Iſſues; otherwiſe, the Waters would grow cold again in their Paſſage through the Earth: Whereas, allowing they acquire their Heat in the Manner I have laid down, it will be not only continual, but always the ſame, or nearly ſo. Having thus deſcribed the Cauſe of the Heat and Impregnations in the *Aix* Waters, I ſhall proceed to conſider the Virtues and Properties of their inherent Principles.

The Virtues of Sulphur I have already ſpoke to pretty largely, in treating of the *Spaw* Waters; as a Principle with which they are impregnated. However; as it exiſts in the Waters of *Aix*, in a different Form, Mixture, and Proportion; ſo it may not be amiſs to conſider it under this new Shape.

It would be unneceſſary to repeat here, that Sulphur, however ſhaped, mixed, or modelled, is perhaps one of the greateſt Purifiers of the Blood in Nature. Beſides that, it rarefies the Blood beyond any other Thing, yet diſcovered; whether in the vegetable or mineral Worlds (Opium excepted.) It is by Means of this rarefactive Faculty, that it reſolves, attenuates, and divides all groſs Concretions, and other viſcous Combinations of Humours in the Blood, or elſewhere: And it not only fits and prepares ſuch Humours to go off by Perſpiration, but generally expells them by that Secretion; and ſometimes (though more rarely) by Stool and Urine. It greatly promotes the Digeſtion and Concoction of ill Humours, and is equally good in many acute, as well as chronical Diſeaſes. In many of the latter Denominations, it entirely exterminates their very Seeds and firſt Principles; and in thoſe of the former, it cures by bringing on a Criſis. It is too well known, to need mentioning here; how efficacious Sulphur (even in its moſt coarſe and common Form and Nature) is in all ſcorbutic, and other cutaneous Eruptions: And I am very much of Opinion (though I have no Authority for it, but my own Reaſon and Conjecture) that ſo pure a ſulphureous Eſſence, as is contained, and in ſo great Plenty, in the *Aix* Waters, would, if judiciouſly directed and long uſed, exterminate the Leproſy itſelf.

It is notorious of what admirable Uſe this Foſſil (eſpecially as it exiſts in the *Aix* Waters) is in Phthiſicks, Aſthmas, and all other Diſeaſes of the Breaſt. It is a Specific in all Diſeaſes of the Reins and Ureters; and forcibly diſſolves and expels both Gravel and Stone: The laſt of theſe it performs by deſtroying (as I have obſerved before in my Treatiſe on the Waters of *Spaw*) their Cement, and the Firſt by increaſing the Motion of the Fluids; and conſequently the Expulſion of Humours, *&c.* which it greatly facilitates; by ſoftening (at the ſame Time) and relaxing the Paſſages, and ſo rendering them capable of greater Diſtenſion.

The Salt which theſe Waters manifeſt upon their Analyzation, is, as above obſerved, of the neutral Kind; and of a ſub-acrid, picquant Taſte. One very conſiderable Property or Uſe of this Salt is; that, by opening the Body of the ſulphureous Particles, theſe are more infinitely divided, and more intimately mixed, and united with the Waters, than ~~ſo~~ ſpongy and tenacious a Subſtance would otherwiſe be capable of. But as Nature is no where niggardly in beſtowing Endowments on what ſhe produces to Light: So this Salt, beſides the Property already aſcribed to it, has ſeveral innate, medicinal Virtues, proper and peculiar to itſelf. It is highly abſterſive and cleanſing: By means of which Properties, it ſcours (in ſome Degree at leaſt) all the Veſſels of the Body in general; but more particularly the Stomach and Guts, from any ſort of Filth, which may adhere to them, ſo as to clog and depreſs their elaſtic Force, and obſtruct their natural Functions. If it meets with any Filth in the Stomach, it uſually diſcharges it by vomiting; and ſometimes, though more rarely, by Stool: But if it encounters Filth, or any kind of noxious Humours in the Inteſtines, it always diſcharges them by Stool; and, according to the Quantity and Quality of the Humours offending, it will ſometimes create a very notable Conflict for a Time; 'till Victory inclining to the Remedy, the Enemy yields. But the chief and ſovereign Virtue of this Salt is, that, when coacting with the Sulphur, whilſt This rarefies, attenuates and reſolves the noxious Humours; That, by irritating the Solids, increaſes their Niſus or Action; and, by that Means, enables them more effectually to throw off the Humours ſo prepared by ſome Secretion.

Thus far, I have only pointed out the Virtues and Properties of theſe two Principles, as they are ſimple and ſeparate: It may now be expected I ſhould conſider them in their mixed or compounded State; determine on their conjunct Qualities, and direct them to ſuch Diſeaſes as they appear moſt ſingularly, and eminently good for.

The *Aix* Waters, being impregnated with ſuch Principles, and in the Quantities and Qualities above named; muſt neceſſarily poſſeſs the following Virtues and Properties. And firſt: They are peculiarly calculated to diveſt and cleanſe the Stomach from all ſlimy, glutinous, or other noxious Humours: They warm, comfort and revive it, if cold, weak, and vapid: They ſtrengthen its Ferment, and correct a redundant Acid: They cleanſe, warm, and comfort the Guts; and invigorate, as well as ſtrengthen their periſtaltic Motion. They deſtroy Worms, and totally exterminate their very Seeds and firſt Principles. Theſe Waters are a ſovereign Remedy for Coughs, Phthiſicks, Aſthmas, and almoſt all other Diſeaſes of the Breaſt. They are of ſingular Uſe and Benefit in the Jaundice, whether the yellow or black; whether recent or inveterate. They are a Specific in pluretic and rheumatic Diſorders; in which they not only palliate, and relieve the Effects; but oftentimes extirpate their Cauſes. It is notorious, of what admirable Uſe and Efficacy theſe Waters are in all ſcorbutic Diſorders; nor can they fail to equal (perhaps) any other Medicine in the Reduction of the Scrophulous and Strumous: Indeed, I cannot ſuppoſe them void of Uſe, even in the Gout. They are a Specific of the firſt Rank, in the Gravel and Stone; and likewiſe for all Ulcers in the Bowels, whether the Guts, Reins, or Ureters. All Experience teſtifies (what Reaſon in this Caſe plainly ſpeaks) that they are of ſtupendious Uſe and Efficacy in all inflammatory Diſeaſes; eſpecially thoſe of the Bowels and urinary Ducts; bleeding being premiſed; and ſuch other Helps joined with them, as the good Phyſician ſhall think convenient. I will not preſume to extend their Benefits to ſtubborn, radicated, venereal Caſes; but in recent Claps, they will happily and ſpeedily do the Buſineſs, with only a very little Help drawn from the Galenical and Chymical Provinces: Indeed, it's to be wiſhed their Utility in this Particular, was univerſally known; as it might hinder many a good Conſtitution from being ſhattered and debilitated by Medicines (which are but too much in Uſe amongſt Quacks and ignorant Pretenders to great Secrets in that Way; not to mention ſome Men of Learning and a regular Education) that have a rugged and violent Operation.

To conclude; I flatter myſelf (and I hope Phyſicians, and others, who are well acquainted with the *Aix* Waters, and intereſted in them, will agree with me) that I have given a pretty compleat (though brief) Account, of their moſt eminent and conſpicuous Virtues and Uſes: Though, I allow, they may be uſed indifferently, in many other Caſes, with ſome Proſpect of Succeſs from them.

Indeed; a good deal might yet be ſaid in behalf of theſe Waters, as applicable externally: For it's well known, and univerſally acknowledged; that in radicated, fixed Tumours, proceeding from a cold, phlegmatic Cauſe; as alſo in fixed Pains, ariſing from the like Cauſes; very extraordinary Cures have been performed by bathing in the Waters, and pumping them upon the Parts affected: But what I have delivered concerning their internal Uſe, will be a ſufficient Light and Guide, when and in what Circumſtances to uſe them externally; Wherefore I chuſe to ſpare my ſelf the Trouble of writing; and and the Publick that of reading, what in Reality, would be a ſort of Tautology.

I have delivered my Sentiments upon the *Aix* Waters, in ſuch a Style, as may perhaps be thought ſomewhat poſitive and peremptory: When, at the ſame Time, I declare that I have neither the Authority of Experience or Tradition for what I ſay: But have given an Account (meerly rational) of their Virtues and Properties; deduced from a mechanical Conſideration of the Principles with which they appear to be impregnated.

If ever Inclination or Accident ſhould lead me to viſit *Spaw*, and *Aix la Chapelle*, again; I propoſe to make, yet a more minute Search and Enquiry into the Natures, Virtues, and Properties of their reſpective Waters: For in my frequent Reflections upon them, ſince my Return into *Holland*; I ſuggeſted to myſelf ſeveral Ways of torturing them; which have not been thought of; or at leaſt not deſcribed by any of the Authors I have met with: And, if this little Eſſay ſhould appear acceptable to the World; I may probably acknowledge its Indulgence, by giving a larger, and more finiſhed Treatiſe upon the ſame Subjects.

CHAUD FOUNTAINE, &c.

ON my Return from *Spaw*, my Curioſity led me to viſit *Chaud Fountaine*, and *Huy*. The firſt of theſe is a Spring of lukewarm Water, which iſſues out of the Earth in great Plenty; and is raiſed by four Pumps into a large Ciſtern, from whence its conveyed by Pipes into ſeveral commodious Baths. This Spring lies in a large Gut, or Valley, near the Side of a ſhallow River; which, by Reaſon of its Caſcades, and the Mountains that run on each Side of it; and whoſe Turnings and Windings ſeem exactly parallel with it; exceeds, for Beauty and Agreeableneſs of Proſpect, any Thing that the *Latin* Poets have deſcribed, or that Fancy could ſuggeſt.

I confeſs I was highly raviſhed with my Paſſage down the River, from thence to *Liege*, in a Boat. That Place was certainly ly calculated for, and deſigned to be the Seat of the Muſes, however they came to miſs of it: For nothing could more irradiate and inſpirit a poetic Vein. I had not an Opportunity of making any other Inquiries into the Nature of this Water, than by the Taſte only; which does not ſuppoſe it to be impregnated, in any Degree, with Minerals, either as to Quality or Quantity. And hence; though I allow it to be an agreeable Bath; yet I cannot conceive it poſſeſſes any extraordinary Virtues or Qualities.

The HUY.

Huy, is a Town ſituate on the River *Meuſe*; the Midway betwixt *Liege* and *Namur*. It has only one Spring, which they account Mineral, about five hundred Paces without the Town: It riſes out of the Earth, in a Flat, near the Side of a River. I examined its Water by the Taſte only: And though the Inhabitants of the Town make great Account of it, I could not diſcover the Marks of any great Virtues in it, nor any Characters of mineral Impregnations. I met with a Religious (as I remember, a Jeſuit) coming back from it; who gave me a long Detail of its Virtues and Cures. But as his Report agreed very ill with that of my own Senſes; I had not Faith enough to believe him, nor Curioſity enough to commit what he told me to Memory.

The CHEVERON.

I think there is only one other mineral Fountain diſcovered in thoſe Parts: And that is the *Cheveron*, whoſe Waters are commonly called *Bru*: But as this Water deſerves rather to be exploded than recommended to the World, on account of a noxious Mineral it contains (as I have mentioned in my Preface) ſo I did not take the Trouble of going to examine it.

The Fountain LOUZANA.

If we take a Survey of Mineral Waters in general, we ſhall find them, according to their different Impregnations, to be very ſtupendious, and no leſs variable from each other, in their Qualities and Effects. We ſee ſome which ſoften, and even diſſolve a Stone; and others which endurate, and even petrify whatſoever is immerſed in them. But the moſt ſurpriſing *Phænomena* which preſent in any mineral Spring in Nature (perhaps) are thoſe of the Fountain called *Louzana*, in the Kingdom of *Galicia*; ſituate in a high Mountain called *Cebret*, near the Source of the River *Lours*. It is reported by Authors of Credit, that this Fountain flows and ebbs alternately and regularly, like the Sea: though in my Opinion, it cannot reaſonably be ſuppoſed to communicate with it, or depend on it; being above twenty Leagues diſtant from it. But what is yet more ſurpriſing, is, that this Fountain is reported to be at ſometimes as cold as Ice, and at others very hot.

One of the German Authors above mentioned, has undertaken to aſſign the Cauſes of thoſe extraordinary *Phænomena*: But, in my humble Opinion, with no better Succeſs, nor greater Probability of Truth on his Side, than he has attempted the Explanation of many other Things, in the ſame Sphere; though indeed, of different Natures. He has really explained them into yet greater Obſcurity; or at leaſt, has explained nothing about them; as I believe it will appear to every judicious Reader.

As to the firſt mentioned *Phænomenon*; the Flux and Ebb of this Fountain; he ſays, it depends on that of the Sea; and he offers as a Reaſon for his Opinion, that this Fountain is horrizontally parallel with the Sea's Surface. A very violent Preſumption this; to ſay peremptorily, that a Thing ſituate above twenty Leagues diſtance from the Sea, is exactly upon a horrizontal Parallel with its Surface! A Man ſhould be accurately skilled in the Art of Surveying, or rather in Calculations of that Sort, to make this appear. And after all (allowing that) it will require a great many Arguments to prove, that the

Fountain in Queſtion, has ſuch a Connection with, or Dependance on the Sea, as thus to ſympathize with it in its ebbing and flowing. But, to ſay no more; the very Situation he gives to this Fountain, is a plain Contradiction to the Cauſes he aſſigns to the *Phænomenon*. As to the latter *Phænomenon*; he ſays, that the Coldneſs of the Water is its natural Temperament; but that its Heat is preternatural and adventitious: But, the Cauſes he aſcribes to this *Phænomenon*, are ſo uncooth, intricate, and trifling, and depend on ſo unreaſonable Poſtulata, that I forbear to recite them. For my own Part, though it would be very eaſy to find out Cauſes, equally at leaſt, if not more plauſible than thoſe I hint at: Nevertheleſs, I confeſs my Weakneſs, and Inſufficiency for ſuch a Task; and that I am not a little ſtaggered when I think of it. Indeed, theſe *Phænomena* ſeem to me to be amongſt the *Inſolubilia*; or thoſe Things which are too deep for a human and finite Capacity to fathom.

In a Word, I defy all the Adepts in Chymiſtry (in which Commodity *Germany* is very fertil; and 'tis from that Source that the Definitions of theſe Problems muſt be drawn) to produce a Solution that will ſtand the Teſt of Examination.

FINIS.